Volume 165 January-June 1984

NATIONAL GEOGRAPHIC

INDEX

January-June 1984

VOLUME 165

PUBLISHED BY THE
NATIONAL GEOGRAPHIC SOCIETY
WASHINGTON, D. C.

NATIONAL GEOGRAPHIC SOCIETY

WASHINGTON, D. C.

Organized "for the increase and diffusion of geographic knowledge"

GILBERT HOVEY GROSVENOR
Editor, 1899-1954; President, 1920-1954
Chairman of the Board, 1954-1966

THE NATIONAL GEOGRAPHIC SOCIETY is chartered in Washington, D. C., in accordance with the laws of the United States, as a nonprofit scientific and educational organization. Since 1890 the Society has supported more than 2,450 explorations and research projects, adding immeasurably to man's knowledge of earth, sea, and sky. It diffuses this knowledge through its monthly journal, NATIONAL GEOGRAPHIC; its books, globes, atlases, filmstrips, and educational films; *National Geographic WORLD*, a magazine for children age 8 and older; information services; technical reports; exhibits in Explorers Hall; and television.

GILBERT M. GROSVENOR, President
OWEN R. ANDERSON, Executive Vice President
ALFRED J. HAYRE, Vice President and Treasurer
WILLIAM T. BELL, FREDERICK C. GALE, LEONARD J. GRANT,
JOSEPH B. HOGAN, ADRIAN L. LOFTIN, JR., LEWIS P. LOWE,
RAYMOND T. McELLIGOTT, JR., Vice Presidents
EDWIN W. SNIDER, Secretary and Corporate Counsel

BOARD OF TRUSTEES

MELVIN M. PAYNE, Chairman of the Board
OWEN R. ANDERSON, Vice Chairman
LLOYD H. ELLIOTT, Vice Chairman
President, George Washington University
THOMAS W. McKNEW, Advisory Chairman

THOMAS E. BOLGER
Chairman of the Board, Bell Atlantic

FRANK BORMAN, Chairman of the
Board and President, Eastern Airlines

ROBERT L. BREEDEN

J. CARTER BROWN, Director,
National Gallery of Art

WARREN E. BURGER
Chief Justice of the United States

MICHAEL COLLINS
Vice President, LTV Aerospace
and Defense Company

GEORGE M. ELSEY, President
Emeritus, American Red Cross

WILBUR E. GARRETT

GILBERT M. GROSVENOR

ARTHUR B. HANSON, Attorney

A. LEON HIGGINBOTHAM, JR.
Judge, U. S. Court of Appeals
for the Third Circuit

JEROME H. HOLLAND
Former U. S. Ambassador to Sweden

CARLISLE H. HUMELSINE
Chairman of the Board,
The Colonial Williamsburg Foundation

MRS. LYNDON B. JOHNSON

CURTIS E. LeMAY, Former Chief
of Staff, U. S. Air Force

LAURANCE S. ROCKEFELLER
Chairman, Memorial Sloan-Kettering
Cancer Center

ROBERT C. SEAMANS, JR.
Henry R. Luce Professor of
Environment and Public Policy,
Massachusetts Institute of Technology

JAMES H. WAKELIN, JR., Former
Assistant Secretary of Commerce
for Science and Technology

CONRAD L. WIRTH, Former
Director, National Park Service

Trustees Emeritus

CRAWFORD H. GREENEWALT
CARYL P. HASKINS
WM. McCHESNEY MARTIN, JR.
FREDERICK G. VOSBURGH
JAMES E. WEBB

COMMITTEE FOR RESEARCH AND EXPLORATION

MELVIN M. PAYNE, Chairman
T. DALE STEWART, BARRY C. BISHOP, Vice Chairmen
EDWIN W. SNIDER, Secretary

HARM J. DE BLIJ, Professor of Geography, University of Miami, GILBERT M. GROSVENOR, CARYL P. HASKINS, Former President, Carnegie Institution of Washington, THOMAS W. McKNEW, BETTY J. MEGGERS, Research Associate-Anthropology, Smithsonian Institution, PETER H. RAVEN, Director, Missouri Botanical Garden, CHARLES H. SOUTHWICK, Professor of Biology, University of Colorado, GEORGE E. STUART, JAMES H. WAKELIN, JR., GEORGE E. WATSON, Curator of Birds, Smithsonian Institution, FRANK C. WHITMORE, JR., Research Geologist, U. S. Geological Survey, CONRAD L. WIRTH, HENRY T. WRIGHT, Professor of Anthropology, University of Michigan, and PAUL A. ZAHL

ASSISTANT VICE PRESIDENTS: James P. Kelly, Thomas E. Kulikosky, Ross L. Mulford, Ward S. Phelps, Cletis Pride. **ASST. TREASURER:** H. Gregory Platts. **ASST. SECRETARY:** Earl Corliss, Jr. **ASSTS. TO THE PRESIDENT:** Joyce W. Graves, Richard E. Pearson

ADMINISTRATIVE STAFF: *Accounting:* Dorothy L. Dameron, Jay H. Givans, Laura L. Leight, William G. McGhee, George E. Newstedt, David H. Peters. *Administration:* D. Evelyn Carnahan, Robert V. Koenig, Zbigniew Jan Lutyk, Marta M. Marschalko, Myra A. McLellan, Jennifer Moseley, Shirley Neff, Jimmie D. Pridemore, Joyce S. Sanford, Janet C. Soper, Frank M. Twigger. *Computer:* James G. Schmelzer, William L. Chewning, Ronald C. Kline, Richard A. Mechler, Harold E. Smith. *Educational Services:* Wendy G. Rogers, Dean R. Gage, Carl W. Harmon, Jr. *Employee Benefits:* Howard R. Hudson. *Membership Services:* Margaret L. Bassford, Robert C. Dove, William T. McDonnell, Paul B. Tylor, Dorothy M. Wagner, Marguerite M. Wise, Peter F. Woods. *Personnel:* Thomas L. Hartman, M.D., Robert E. Howell, Glenn G. Pepperman, Shirley N. Wilson. *Printing:* Joe M. Barlett, Frank S. Oliverio, Margaret A. Slifer, Hans H. Wegner. *Promotion:* Robert J. Warfel, Joseph S. Fowler, Joan Anderson, Eileen W. Bowering, James R. Dimond, Jr., Robert L. Feige, Thomas M. Kent, Charles T. Kneeland, F. William Rath. *Purchasing:* Robert G. Corey, Thomas L. Fletcher, Sheila H. Immel

ADVERTISING: *Director:* George E. Moffat, 1251 Avenue of the Americas, New York 10020. *Asst. to Dir.:* Eileen K. Ayvazian. *U. S. Advertising Manager:* William K. Hughes. *Office Mgrs.—New York:* William M. Donohoe. *Chicago:* Philip G. Reynolds. *Detroit:* O.W. Jones, Jr. *Los Angeles:* Robert D. Johnson. *San Francisco:* James D. Shepherd. *Europe:* Michel A. Boutin, 90 Ave. des Champs Elysées, Paris. *Marketing/Research:* Alex MacRae. *Promotion:* Pandora Browne. *Administration:* Blanche Coffey. *Business:* Patti A. Delaney-Epple. *Production:* G. Sarita Lapham, Washington, D.C.

COPYRIGHT © 1984 National Geographic Society, 17th and M Sts. N.W., Washington, D. C. 20036.

MELVIN M. PAYNE *Chairman of the Board*

NATIONAL GEOGRAPHIC MAGAZINE

GILBERT M. GROSVENOR *President*
WILBUR E. GARRETT *Editor*
JOSEPH JUDGE *Associate Editor*

SENIOR ASSISTANT EDITORS

John B. Garver, Jr., *Cartography* Robert E. Gilka, *Photography*
William Graves, *Expeditions* Robert P. Jordan, *Special Projects*
H. Edward Kim, *Layout* Edward J. Linehan, *Manuscripts*
Samuel W. Matthews, *Production* O. Louis Mazzatenta, *Control Center*
Charles McCarry, *Contract Writers* Howard E. Paine, *Art*
Carolyn Bennett Patterson, *Legends* Thomas R. Smith, *Illustrations*
Mary G. Smith, *Research Grant Projects* Kenneth F. Weaver, *Science*
Ann K. Wendt, *Research*

TEXT

ASSISTANT EDITORS: Kent Britt, Thomas Y. Canby, Rowe Findley, Bart McDowell, Elizabeth A. Moize, Merle Severy
SENIOR WRITERS: Thomas J. Abercrombie, David S. Boyer, Mike Edwards, William S. Ellis, Rick Gore, Noel Grove, John J. Putman, Peter T. White
SENIOR EDITORIAL STAFF: Harvey Arden, Robert Booth, Allen A. Boraiko, John L. Eliot, Boyd Gibbons, Alice J. Hall, Bryan Hodgson, David Jeffery, Michael E. Long, Priit J. Vesilind, Gordon Young. *Production:* John L. McIntosh
EDITORIAL STAFF: Judith Brown, Larry Kohl, Douglas Lee, Louise E. Levathes, Peter Miller, Cathy Newman, Cliff Tarpy, Jane Vessels
RESEARCH: Lesley B. Rogers (Assoc. Dir.); Michaeline A. Sweeney (Asst. Dir.); *Researcher-Editor:* Susan L. Anderson. *Researchers:* Carolyn H. Anderson, Rebecca Beall, Julia G. Grover, Ann B. Henry, Jan Holderness, Patricia B. Kellogg, Kathy B. Maher, Barbara W. McConnell, Jean B. McConville, Margaret S. Nottingham, Jeanne E. Peters, Frances W. Shaffer. *Geography:* Bette Joan Goss. *Legends:* Victoria C. Ducheneaux, Abigail A. Tipton. *Planning Council:* Gaither G. Kyhos, Mary McPeak

ILLUSTRATIONS

PHOTOGRAPHERS: Dean Conger, Joseph J. Scherschel (Assistant Directors); James L. Amos, Joseph H. Bailey, James P. Blair, Victor R. Boswell, Jr., Jodi Cobb, Bruce Dale, David Alan Harvey, Otis Imboden, Emory Kristof, Joseph D. Lavenburg, Bianca Lavies, Bates Littlehales, Robert W. Madden, George F. Mobley, Robert S. Oakes, Steve Raymer, Robert F. Sisson *(Nat. Science)*, James L. Stanfield. *Administration:* Claude E. Petrone, Susan A. Smith
ILLUSTRATIONS EDITORS: W. Allan Royce (Assistant Director); David L. Arnold, Taylor Gregg, Bruce A. McElfresh, Charlene Murphy, Robert S. Patton, Elie S. Rogers, Jon Schneeberger, Susan Welchman
LAYOUT: Constance H. Phelps, William T. Douthitt
ART: Jan Adkins, J. Robert Teringo (Assoc. Directors); *Artists:* William H. Bond, Ned M. Seidler. *Design:* Charles C. Uhl (Asst. Dir.); Betty Clayman
ENGRAVING AND PRINTING: William W. Smith (Director); James R. Whitney (Assoc. Dir.); Bill M. Aldridge, John T. Dunn, Judy L. Garvey, John W. Gergel

CARTOGRAPHY

Richard J. Darley (Senior Assoc. Director); John F. Shupe (Assoc. Director); Walter Q. Crowe, John F. Dorr, Harold A. Hanson, Harry D. Kauhane, Richard K. Rogers, Elie Sabban (Asst. Dirs.). *Map Editors:* Thomas A. Walsh (Supvr.); John T. Blozis, Russel G. Fritz, Charles W. Gotthardt, Jr., Thomas L. Gray, Mary Anne McAleer, Gus Platis. *Artists:* Lisa Biganzoli, John W. Lothers, Nancy Schweickart, Sally Suominen-Summerall, Tibor G. Toth. *Archaeologist:* George E. Stuart. *Geographer:* Ted Dachtera. *Researchers:* Timothy J. Carter, Ross M. Emerson, Marguerite B. Hunsiker, Mary C. Latham, Dorothy A. Nicholson, Douglas A. Strobel, Susan Young. *Map Artists:* Roland R. Nichols, Leo B. Zebarth (Supvrs.); Iskandar Baday, Alfred L. Zebarth. *Specialists:* Charles F. Case, Martin J. Golden, Thomas A. Wall. *Scheduling:* Charles L. Miller, Henri A. Delanghe. *Admin:* Catherine M. Hart, Patricia M. Oakes

EDITORIAL SERVICES

ADMINISTRATION: M. Jean Vile (Asst. to the Editor), Elaine Rice Ames, Marie L. Barnes, G. Merrill Clift, Neva L. Folk, Lilian Davidson, Virginia H. Finnegan, Eleanor W. Hahne, Mary F. Klemann, Ellen E. Kohlberg, Liisa Maurer, Lucille L. McInerney, Carol D. Rhoads. *Picture Requests:* Barbara A. Shattuck. *Correspondence:* Carolyn F. Clewell, Gwendolyn C. Blackman, Joseph M. Blanton, Jr. *Indexes:* Jolene M. Blozis. *Travel:* Virginia A. Bachant
LIBRARIES: *Publications:* Susan Fifer Canby (Director); Patricia Murphy Smith, Margery K. Barkdull, Karen F. Carrick, Carolyn Locke, Louise A. Robinson, Marta Strada. *Records & Illustrations:* Lorie Northrop (Director); L. Fern Dame, Mary Anne McMillen, M. Scott Bolden, Carolyn J. Harrison, Marguerite S. Northwood, Mennen M. Smith. *Photo Archivist:* Volkmar Wentzel. *Films:* Betty G. Kotcher
NEWS SERVICE: Paul Sampson (Director); Joy Aschenbach, Kenneth C. Danforth, Donald J. Frederick, Rebecca R. Kirtland, Barbara S. Moffet, William J. O'Neill. *Radio:* Robert C. Radcliffe
PHOTOGRAPHIC LABORATORIES AND TYPESETTING: Carl M. Shrader (Director); Milton A. Ford (Associate Director); Lawrence F. Ludwig (Asst. Director); Herbert Altemus, Jr., Billy R. Barnett, Richard A. Bredeck, David H. Chisman, Ellwood M. Kohler, Jr., Geoffrey T. McConnell, William S. Petrini, Bernard G. Quarrick, Joan S. Simms, James H. Trott, Alfred M. Yee

RELATED EDUCATIONAL SERVICES OF THE SOCIETY

ROBERT L. BREEDEN *Vice President*

SENIOR ASSISTANT EDITORS: Donald J. Crump, *Special Publications and School Services;* Charles O. Hyman, *Book Service*
BOOK SERVICE: Greta Arnold, Ross Bennett, Mary Dickinson, Karen F. Edwards, Suzanne Kane, Anne D. Kobor, J. Edward Lanouette, Carol B. Lutyk, Linda B. Meyerriecks, Elizabeth Newhouse, David F. Robinson, Shirley Scott, David M. Seager, Margaret Sedeen, Susan Sidman, Penelope Timbers, Jonathan Tourtellot, Anne Withers
SPECIAL PUBLICATIONS AND SCHOOL SERVICES: Philip B. Silcott (Assoc. Dir.); William L. Allen, William R. Gray (Asst. Dirs.); John G. Agnone, Jody Bolt, Jane H. Buxton, Marilyn W. Clement, Margery G. Dunn, Toni Eugene, Seymour L. Fishbein, Ron Fisher, Patricia F. Frakes, Barbara Grazzini, Mary Ann Harrell, Suzanne J. Jacobson, Bonnie S. Lawrence, Christine E. Lee, Jane R. McCauley, Tom Melham, Robert Messer, H. Robert Morrison, Thomas O'Neill, Thomas B. Powell III, Cynthia Ramsay, Jennifer C. Urquhart, George V. White, Merrill Windsor. *National Geographic WORLD:* Ralph Gray (Editor); Pat Robbins (Mng. Ed.); Jacqueline Geschickter, Pat Holland, Joan Hurst, Tee Loftin, Margaret McKelway, Veronica Morrison, Judith Rinard, Eleanor Shannahan, Ursula Vosseler. *Educational Media:* George Peterson (Editor); Jimmie Abercrombie, David F. Beacom, James B. Caffrey
PUBLICATIONS ART: John D. Garst, Jr. (Director); Virginia L. Baza (Asst. Dir.). *Map Artists:* Isaac Ortiz, Peter J. Balch
TELEVISION AND FILMS: Dennis B. Kane (Director); Sidney Platt (Director, Educational Films); Donald M. Cooper, Anne B. K. Krumbhaar, Yeorgos N. Lampathakis, Karen S. Marsh, Louise C. Millikan, Marjorie M. Moomey, Nola L. Shrewsberry, Kathleen F. Teter, Carl E. Ziebe
AUDIOVISUAL: Joanne M. Hess (Director); Jon H. Larimore (Tech. Director); Ronald S. Altemus, Robert G. Fleegal, Paul Gorski, Gerald L. Wiley

Index

VOLUME 165 JANUARY-JUNE 1984

January	pp. 1-142	April	pp. 423-554
February	pp. 143-280	May	pp. 555-694
March	pp. 281-422	June	pp. 695-834

Titles and illustrations in boldface

A

A-10 (aircraft) **358**
AH-64 Apache (attack helicopter) **358**
Abalone: Sea otter diet 461
Abbas Ali Shah **708**
Abdullah, King (Jordan) 242, 245, 254
Abell, Doug **394**
Abell, Sam, photographer: ***Hagi: Where Japan's Revolution Began.*** June, 751-773; ***The Olympic Peninsula.*** May, 644-673
Abercrombie, Stewart 435
Abercrombie, Thomas J.: ***Jordan: Kingdom in the Middle.*** Feb., 236-267
Abraham (patriarch): Traditional tomb 262, **266-267,** 267
Acanthops (mantis) **279**
Adelman, Andrew 342-343
Admiralty Island, Alaska: Brown bears 64-65, 67, 80
Afghan refugees: Pakistan 705, 707
Africa: Continental drift 572, 574; Drought **148-149,** 155, 175, 176, 178, **178-179,** 181, **182-183**
African wildlife: Mantids **277, 278-279;** Stink ant **783;** ***They're Killing Off the Rhino.*** By Esmond Bradley Martin. Mar., 404-422; Weaver ants **780-784,** 792-794
After 2,000 Years of Silence, the Dead Do Tell Tales at Vesuvius. By Rick Gore. May, 557-613
Aghazarian, Albert 261
Agnelli, Giovanni 206
Agra, India 718, **722-723,** cover; Agra Fort station **702-703**
Aiaginar, Jimmy **831**
Aiguablava, Spain 125, 127
Ain Ghazal (archaeological site), Amman, Jordan: Antiquity of 249, 261; Plaster statues **261**
ajagaq (Inuit game) **531**
Akbar's Mausoleum, Sikandra, India 718
al-Anani, Jawad 243
Alaska: *Alaska,* The Making of America map series. Jan. supplement; ***Eskimo Hunters of the Bering Sea.*** By Brad Reynolds. June, 814-834; Statehood anniversary 60; *see also* Southeast Alaska, *outlined*
Alaska brown bears 64-65, 67, 80; Claws **66-67**
Alaska Lumber and Pulp mill (Sitka): Japanese ownership 64
Alaska National Interest Lands Conservation Act of 1980 64
Alaska Native Claims Settlement Act of 1971 60, 71; Terms 828
Alaska Panhandle: ***Alaska's Southeast: A Place Apart.*** By Bill Richards. Jan., 50-87
Alaska's Southeast: A Place Apart. By Bill Richards. Jan., 50-87
al-Auja, Jordan 261
Alava, Cape, Wash.: Ancient whaling camp 672
Alberta (province), Canada *see* Calgary
Alcoholic treatment center: Calgary, Alberta, Canada **390**
Alcoholism: Yupik Eskimos 822
Alcyonarians **468-469, 478-479, 484**
Aldoz Pilaloa, Luis 167
Aleqatsiaq (Inuit) 530, 538
Alès, France: Silkworms, plague affecting 39
Aleuts: Alaska Native Claims Settlement Act 828
Alexander the Great 30
Alexander Archipelago, Alaska: ***Alaska's Southeast: A Place Apart.*** By Bill Richards. Jan., 50-87; ***An Incredible Feasting of Whales.*** By Al Giddings. Jan., 88-93
Algae: Antarctic Regions **643;** Phytoplankton 138; Piccaninnie Ponds, South Australia 129, **136, 142**
Alia (Royal Jordanian Airline) 238
Alirkar, John **824**
al-Jabal tribe: Sheikh 256
Al Jafr Basin, Jordan 245
Allenby Bridge, Jordan River 242, **243**
Alpine, Texas 228; Bar **235;** University students **221, 232**
al-Zagha, Hisham 248
Amati, Andre and Nicolò 207
Amazon ants: Slavery 807, 811, raids **806-807,** 811
Amazon Basin Indians *see* Kayapo Indians
Amber: Fossil ants 779
American Bank Note Company: Hologram produced by 372, cover
The Americas: Introduction of sericulture 12
Amin, Idi 404
Amish: ***The Plain People of Pennsylvania.*** By Douglas Lee. Apr., 492-519
  Beliefs 493
  Children: Education 495; Farm work **504-505, 510;** Provision for 498, 505; Recreation 495
  Church: Congregations, number of (Lancaster County) 501; Divisions, historical 503
Communities 493, 498
Domestic skills: Canning **511;** Quilting **502-503;** Sewing 495
Farm machinery 505; 1921 steam engine **516;** Parts replacement 512, 517; Use of, limited 505
Farming skills 498, 508, 517
Farms **508-510, 516-517;** Buying and selling of 498, 509; Cash crops 511; Cooperative labor **510, 516-517**
Home shops 512, 517
Marriage 495, 497
Modern conveniences, rejection of 493, 495, 505, 509; Exceptions 505, 506
Origins 493, 498
"shunning" 497, 498
Transportation, nonmotorized **492-493;** Exception to 506
Youth: "hired boys" 505; Social life 495
Amish Mennonites (sect): Missions 503; Modern conveniences allowed 506; Quilting **502-503;** Youth **502-503**
Amman, Jordan 242-243, 248, **254, 255;** Archaeological excavation 249, 261; College graduates **237;** Palestinian refugees **262-263;** Snowfall **258-259**
Ammann, Jacob 498
Ammonites (people) 254
Ampurias (Greek colony), Spain 119
Amritsar, India 708
Anabaptists 493, 498
Anchor remnant, Roman: Herculaneum, Italy **603**
Anchoveta industry: El Niño currents affect 155, 164, 167; Overfishing 164, 167
Anderson, George 391
Anderson, Owen R.: Quoted 695
Angoon, Alaska: Tlingit Indians **72,** spirit men **74, 75;** U. S. destruction of 71, 75
Angutikavsak (Inuit) 530, 535, 538, 539
Animal behavior: ***The Ant and Her World.*** By Caryl P. Haskins. June, 774-777; ***An Incredible Feasting of Whales.*** By Al Giddings. Jan., 88-93; ***Lord of the Shallows–The Great Blue Heron.*** By Richard J. Dolesh. Apr., 540-554; ***Mantids, the Praying Predators.*** By Edward S. Ross. Feb., 268-280; ***Ways of the Ant.*** By Bert Hölldobler. June, 779-813
Animal sacrifice: Nepalese Hindu rite 417-418

Anlong, China 312-313
The Ant and Her World. By Caryl P. Haskins. June, 774-777
Antarctic Regions: ***Krill–Untapped Bounty From the Sea?*** By William M. Hamner. May, 626-643
Antarctic Treaty (1959) 642
Antares (laser) 362
Antbird, bicolored **798**
Anthony, June 178, **180**
Anthropology: ***The Dead Do Tell Tales at Vesuvius.*** By Rick Gore. May, 557-613
Antique shop: Intercourse, Pa. **513**
Antisatellite systems: Lasers **360-361,** 362
Ants: ***The Ant and Her World.*** By Caryl P. Haskins. June, 774-777; ***Ways of the Ant.*** By Bert Hölldobler. June, 779-813
Adaptations 779, 785, 786, 792
Agriculture **796,** 800
Altruism 776, 786
Anatomy **787;** Cutaway painting **787;** *see also* Mandibles, *below*
Beetles, relations with **808-809,** 811; Parasitic beetles 809, **810,** 811
Castes 776, 784, 786, 789, 794, 797, 800; Honeypots **802,** 803, **805,** 811
Colonies 785, 786, 793, 797, **798-799,** 801; Areas covered 783, 792; Establishment 794, 800, 807, 813; Populations 776, 777, 779, 783, 785, 792, 794, 797, 800, 803, 813; *see also* Nests, *below*
Communication 777, 787, 792, 793; Chemical *see* Odor trails; Pheromones, *below;* Tactile 774, **774-775,** 775, 781, 786, 787, 793; Use by beetles 808, 809, 811
Defenses 776, 782-783, **782-783,** 786, 793; Formic acid 782, 783, 787, 807; Mandibles **806, 807**
Diets 777, **778,** 784, 785, 789, 792, 794, 796, 797, 800, **801,** 803, **812-813**
Eggs 775, 789, 794, 800, 801
Evolution 774-775, 776, 779, 785
Femaleness 775, 777, 779, 786
Foragers 784, 793, **802**
Formic acid 782, 783, 787, 793, 807
Herding **784,** 793-794
Hunting **778,** 786, 793, 797, **798-799,** 801
Larvae **780, 781, 788-789,** 792, 793, **796,** 800, 801, **802, 810,** 811
Males 775, 789, **790-791, 793,** 794, 800; Death 791; Mating frenzy **790-791,** 794, 800
Mandibles 774, **774-777, 794, 798, 806, 807,** 811
Mounds **812-813,** 813
Nests 783, **783,** 792, 796, 800; Construction **780-781,** 792, **793**
Nomads *see* Army ants
Nuptial flights 789, 790-791, 794, 800
Odor trails 783, 793, 794, 803, 806, 808; Beetles use 808, 811
Parasitism **806-807,** 811
Pheromones 775, 776, 786, 787, 789, 791, 793, 794, 800, 811 *see also* Odor trails, *above*
Queens 775, 785, 786, **788, 792, 793,** 794, 796, 797, 801, **802,** 807, 811, 813; Mating frenzy **790-791,** 794, 800
Reproduction *see* Queens, *above*
Senses 777, 784, 786
Slavery 804, 807, 811; Raids **806-807,** 811
Social behavior 774-775, 776, 779, 785, 786
Soldiers **774-775,** 776, 786, **798**
Species, number of 776
Territoriality 782, 786, 792, 793, 803
Tournaments, ritualized 803, **804-805,** 811
Wings 789, **790-791, 792, 793,** 794, 800
Workers **774-775,** 775, 776, 777, **778, 793,** 794, **794, 795;** Fertility suppressed 786, 789, 794; Specialization *see* Castes, *above*
Anvers Island, Antarctica *see* Palmer Station
Aphids: Ants, herded by 793-794
Aphrodisiacs: Animal products 410, 411, 413, 417, 537
Aqaba, Jordan **240-241,** 256-257; Egyptian workers **241;** Population growth 240; Port development 240, 257
Aquatic plants: ***Exploring a Sunken Realm in Australia.*** By Hillary Hauser. Jan., 129-142
Aquilas (RPVs) **358-359**
Arab-Israeli wars 242, 245, 249
Arab nations *see* Jordan
Arab Potash Company: Dead Sea saltworks 256
Arai, Junichi 48
Aran, Valle de, Spain **98-99**
Archaeological sites: California regulations 433, 456; Jordan 241, 261; Washington 672; *see also* Herculaneum
Archaeology: ***The Dead Do Tell Tales at Vesuvius.*** By Rick Gore. May, 557-613
Archery, Japanese 764
Architectural design competition: California Polytechnic State University **440-441**
Arctic Regions: ***Narwhal Hunters of Greenland.*** By Ivars Silis. Apr., 520-539
Arden, Harvey: ***East of Eden: California's Mid-coast.*** Apr., 424-461
Argon laser **334,** 352, **353,** 355, 363
Armani, Giorgio 201, 205
Armor, samurai **49**
Army ants **797, 798-799,** 800, **801,** 803
Arneil, Peter **85**
Arnold, Greig 672
Arratia, Adolfo 170
Arriaga, MeMe 234
Arrow ritual, Tibetan **312-313**
Art, Roman: ***The Dead Do Tell Tales at Vesuvius.*** By Rick Gore. May, 557-613
Art restoration: Laser cleaners **342;** Sculpture preservation 208
Arthur D. Little, Inc.: Sow-ear silk purse 15
Artichoke Festival, Castroville, Calif. 442
Arutua atoll, French Polynesia: Storm **144-145**
Asia: ***They're Killing Off the Rhino.*** By Esmond Bradley Martin. Mar., 404-422; *see also* China; India; Japan; Jordan
Asian Development Bank: Loan to Bangladesh 743
Asmus, John 336
Assam Mail (train): Passengers **718**
Assam Valley, India: Muga silkworms 14
Astroni (volcano), Italy 623
Asuluk, Anna **819**
Asuluk, Joe 816, 822
Asuluk, Lucy **819**
Audubon, John James: Quoted 542
Aurness, Craig, photographer: ***East of Eden: California's Mid-coast.*** Apr., 424-461
Australia: Ants 774, **774-775, 778,** 779, 785, 786, 792; Bushfires 171, 174, **176-177,** deaths 174, 176; Climate 153; Droughts 151, 152, 153, 155, 171, 173, **173, 174, 175;** Dust storms **150-151,** 153, 155, 171; Sheep 153, slaughtered because of drought 152, **152,** 153; Wheat 152, 153; *see also* South Australia
Australian-Indonesian low (weather system) 152-153, 162, 170, 181; Great Red Spot of Jupiter compared with 153, 170, 181
Australian snake-necked tortoise **142**
Automobiles, junked: Green River, Utah, riprap **161**
Automotive industry: Italy 186, 187, 198, 205, 206, design **198-199;** Laser applications 335, **348-349,** 355
Autumn Club festival: Dong (people) 325, 332
Aviation industry: Head-up displays **376-377**
Aycart, Jimmy 160
Ayodhya, India 727
Azraq oasis, Jordan 256; Prehistoric site 249

B

Babb, Jewel 227-228, **231,** 233
Baboo, Suresh 712, 716
Baby race: Monterey County Fair **442**

Bacchus (Greek wine god) **557**
Badia a Coltibuono (estate), Italy **190**
Baeza, Leroy 229
Baeza, Raul **220**
Bajaj, Bansilal 716-717
Bakersfield, Texas: Vineyard 233
Balbus, Marcus Nonius: Statues of **610,** 613
Bald eagles: Alaska **68-69,** 70; Hologram of 372, **372, 373,** cover
Baleen whales 633; Krill feeding 630, 632-633, 636, 639; *see also* Humpback whales
Ballet class: Calgary, Alberta, Canada **388-389**
Banff, Alberta, Canada 394
Bangalore, India: Benedictine monastery 48
Bangladesh: ***By Rail Across the Indian Subcontinent.*** By Paul Theroux. June, 696-743; Map of rail system 747
Bangor, Wash.: Trident submarine base 659, 666
Ban Kao Kluay, Thailand: Sericulture 19
Baqaa refugee camp, Jordan: Family **262-263**
Baranov, Aleksandr 70
Barber: Peshawar, Pakistan **709**
Barberi, Franco 570
Barça (soccer team) *see* Futbol Club Barcelona
Barcelona, Spain 105; Aerial view **102-103;** Architecture **104,** 105, **105;** Demonstration **109;** Folk dancing **129;** History 101, 113; Population 101
Barn raising: Amish community **516-517**
Barred woodcreeper **799**
Barrio Gótico, Barcelona, Spain **102-103**
Basile, Gianni and Salvatore **192**
Basman Palace, Amman, Jordan 243
Bassam Shak'a 266
Bathhouse: Herculaneum, Italy **580, 581,** 594, 606
Batting, silk **37**
Beachcombing: Monterey, Calif. 458, 461
Bean, Roy **226,** 227, 231-232
Bears: Black bear **67;** Brown bears 64-65, 67, 80, claws **66-67**
Bearskin pants **521,** 530, 535
Bedouin: Jordan **246-247,** 252, 256; Sheikh **257**
Beery, Noah 435
Beetles: Ants and **808-809, 810,** 811
Beijing Silk Flower Factory: Silk petals **36**
Beiler, Becky **502**
Bellina, Joseph 352-353
Bellotti, Fabio 48
Bemp (Kayapo Indian festival) 684; Ceremonies **684, 685,** 686-687; Costs 687; Preparations **688-689**
Benavides, Felipe 167
Benedict, Md.: Restaurant 553
Benedictine monasteries: Bangalore, India 48; Montserrat (mountain), Spain 100, 105, **110, 111**
Benton, Stephen **367,** 372
Bering Sea, and region: ***Eskimo Hunters of the Bering Sea.*** By Brad Reynolds. June, 814-834
Berkes, Kálmán 391, 394
Berkhout, Rudie: Holographic art **364-365**
Bethel, Alaska 817, 829
Bethlehem district, Jordan: Farm reclamation 261-262
Bezeklik (Buddhist monastery), China **20-21**
Bicentenary, House of the, Herculaneum, Italy **592**
Bicycles: Mennonites **501, 518-519;** Silk tires 13-14, **37**
Bieber, Margarete: Quoted 594
Bierwagen, Ottmar, photographer: ***Calgary: Canada's Not-So-Wild West.*** Mar., 378-403
Big Bend country *see* Trans-Pecos (region), Texas
Big Bend National Park, Texas 227, 230
Big Plume, Clifford 390
Big Sur region, Calif. **428-429, 431, 438-439,** 443, 461
Big Sur River, Calif. **438-439**
Biography *see* Yoshida Shoin
Biotelemetry: Bald eagles 69, equipment **68, 69**
Biplanes: Pitts Specials **239**
Bird Creek, Calif. 449, 450
Bird refuges: ***Lord of the Shallows–The Great Blue Heron.*** By Richard J. Dolesh. Apr., 540-549
Birds *see* Great blue herons
Birendra, King (Nepal): Blood Tarpan rite 418
Birzeit University, Jordan 258, 261
Bisel, Sara: ***The Dead Do Tell Tales at Vesuvius.*** By Rick Gore. May, 557-613
Black ants **806-807**
Black bear: Alaska **67**
Black Miao (people) *see* Hei Miao
Black rhinoceroses: ***They're Killing Off the Rhino.*** By Esmond Bradley Martin. Mar., 404-422
Black Stream (ocean current) *see* Kuroshio
Black Swamp Creek, Md.: ***Lord of the Shallows–The Great Blue Heron.*** By Richard J. Dolesh. Apr., 540-554
Black Virgin, shrine of the, Montserrat, Spain 100, 110
Black wood ants, European **808-809**
Blair, Bob 395
Blenny **482**
Blood-flow meter, laser **347**
Blood Tarpan (Nepalese Hindu rite) 417-418
Blowfish: Porcupine fish **480-481**
Blue-footed boobies **168**
Blue herons *see* Great blue herons
Blue jeans manufacture: Italy **186**
Boatbuilding school: Port Townsend, Wash. 659, **660, 661**
Boats: Dragon boats 327-328, **328-329;** Longboats 535, 538, 539; Roman 557, 570, 571, **602-603,** 604, 606-607, 610, 611; Sailboats **96-97, 460;** Seiners **165;** Wooden 659, **660, 661;** *see also* Kayaks
Body decoration: Kayapo Indians 684, 690, application **684,** 690, beads 694, ceremonial **674, 676-677, 684, 685**
Boeing 727 (aircraft): Head-up display **376, 377**
Boeker, Erv **69,** 70
Boldt, George H. 669; Decision on Indian fishing rights 669, 672
Bologna, Italy: May Day parade **189**
Bombyx mori (mulberry silkworm) 7, 14
Bone analysis: ***The Dead Do Tell Tales at Vesuvius.*** By Rick Gore. May, 557-613
Boobies, blue-footed: Galapagos Islands **168**
Book of Deaths: Queen of the Missions archives, Santa Barbara, Calif. **434**
Boraiko, Allen A.: ***Lasers–"A Splendid Light."*** Mar., 335-363
Borner, Markus 420-421
Borrelli, Angela **591**
Botswana: Drought **148-149,** 176, 178, **178-179,** 181; Elephants 178, **180,** 181, cover
Bouyei (people) **323;** High school **322**
Box Office (beauty salon), Calgary, Alberta, Canada **401**
Boxing Day: Canada 390
Boyer, David S.: ***Calgary: Canada's Not-So-Wild West.*** Mar., 378-403
Boyer, Keith 343
Bracelets, gold: Herculaneum, Italy **560, 561,** 570, **591,** cover
Brachymyrmex (ant) **776;** Electron micrograph **777**
Bramblett, Sammie 224, **225**
Brandenburg, Jim, photographer: ***They're Killing Off the Rhino.*** Mar., 404-422
Brazil: Gold mining, government-controlled 678, 683, 690, 694; Hydroelectric project, planned 694; Indian population 694; Indian protection agency *see* National Indian Foundation; Indian tribes *see* Kayapo Indians, *outlined;* Road building 678, 688, 694
Brazil's Kayapo Indians, Beset by a Golden Curse. By Vanessa Lea. May, 675-694
Breda company: Subway car manufacture 186, 187
Brehmeyer, Frank 668
Brewster windows **340,** 341
Bridges: Central China: Cable bridges 305, **315,** "wind-and-rain bridge" 328, **332-333;** Railroad 722, **742,** double-decked

720-721, tiered-masonry arch **710-711**
Bristol Bay, Alaska: Salmon industry 817, 831
British India 704; ***India's Railway Lifeline.*** By Michael G. Satow. June, 744-749
Brocade, silk: 18th-century shoe **10;** Tapestry panels **41**
Brochier, Jacques 14
Brooke, John Weston 290
Brooksbank, Buck 174
Brossa, Joan 106, 108
Brown, Steven 71
Brown bears, Alaska 64-65, 67, 80; Claws **66-67**
Bubble netting: Humpback whales 93, diagram **90**
Buddhas, living **306,** 311
Buddhism: Sacred sites 721, 723; Spread of 13, 30; *see also* Tibetan Buddhism
Buggies: Lancaster County, Pa. **492-493, 500, 501, 513**
Bull riding: Rodeo training **220-221**
Bunchberries **76**
Burial customs: Ancient China 26; Tibetans 291, "sky burial" 291, 304-305
Burns, Helen 655
Burns, Michael 346
Bushfires: Australia 171, 174, **176-177**
Bushido (code of the warrior) 755, 761, 764
Bushmen, Kalahari: Mantid lore 272
Buttercups: Aquatic *Ranunculus* **136-137**
By Rail Across the Indian Subcontinent. By Paul Theroux. June, 696-743

C

CBS Laboratories, Stamford Conn. 366
CSIRO (Commonwealth Scientific and Industrial Research Organization), Canberra, Australia: Ant studies 785
Calcutta, India 704, 727
Calgary, Alberta, Canada: ***Calgary: Canada's Not-So-Wild West.*** By David S. Boyer. Mar., 378-403
Aerial views **386-387, 393**
Cattle ranching, decline of 382, 383, 391
Cultural life **388-389,** 390, 391, 394, 403
Downtown **380-381, 384, 385,** 386-387; Plus-15s (elevated walkways) **381, 385,** 386, 390
Economy 400, 401; Oil booms 381, 382, 383, 387; Recession 382, 391, 392, 397, 403, 1983 budget cuts 382; *see also* Oil industry, *below*
Future prospects 382-383, 386, 403
Geophysicists 400
History 378-379, 382, 383
Immigrants 379, 382, **387,** 390, 391, 394; Texans 382, 383
Indians 390, **390,** 402-403
Map locating 383
Mayor *see* Klein, Ralph
Medical research 400
Name origin 379, 397, 402
Oil industry 382, 383, 387, 391, 394, 395, 397; Canadianization 383, 394, 395
Policemen 378, 382, 390
Political climate 382, 394, 400, 401
Population: 1960 392; 1984 382, 392
Skyline **378-379, 386-387**
Sports: Chuck-wagon race **398-399;** Horseback riding **402-403;** Ice hockey 395, 400; Olympic Winter Games host (1988) 387, 392, 400
Suburbs **393**
Trolley system 386
Weather 381, 387, 390
Calgary Petroleum Club 383, 395
Calgary Philharmonic Orchestra 388, 391
Calgary Stampede 378, **385,** 391, **398-399,** 402
California:
Drought (1976-1977) 153, 159, 160
Far West, The Making of America map series. Apr. supplement
Mid-coast region: ***East of Eden: California's Mid-coast.*** By Harvey Arden. Apr., 424-461
Air Force base 430; Missile testing 430, 455; Space shuttle launch site 430, **458**
Earthquakes 434, 450, 452, 455
Farming **426-427,** 453, 456; Migrant laborers **436-437,** 456
Festivals **434,** 442
Highways, major **431,** 432, 442, 443, 444, 461
History 434, 437, 458
Hotels and inns 443
Map 432-433
Nuclear power plant 430, 432, **455**
Offshore oil fields 425, 430, 439, 449
Population 432
Seashore **428-429, 431, 444-445, 460,** 461; Public access controversy 439, 445; Wildlife **424-425,** 461
Spanish missions 434, **434, 435,** 442
Storms 154, 155, **156-159,** 160
California Coastal Commission: Coastal development, regulation of 439, 442
California condor: Refuge 432
California Polytechnic State University: Architectural design competition **440-441**
California State Highway No. 1 **431,** 432, 443, 444, 461
Calista Corporation 829
Calix, Joan 119, 120
Calliou, George 402-403
Camels, Asian **296-297**
Camorra (criminal organization): Naples, Italy 191
Camouflage: ***Mantids, the Praying Predators.*** By Edward S. Ross. Feb., 268-280
Camp David accords 242
Camp Grisdale, Wash. 668
Campi Flegrei (Fiery Fields) region, Italy 617, 620 *see also* Phlegraean Fields Caldera
Canada *see* Calgary
Canada's Not-So-Wild West. By David S. Boyer. Mar., 378-403
Canadian Pacific Railway 379, 383
Canadian Petroleum Association 383
Canby, Thomas Y.: ***El Niño's Ill Wind.*** Feb., 144-183
Cancer treatment: Laser uses 336, **344,** 345, 346, 353
CanDel Oil Ltd. 387
Candelaria, Texas: One-room schoolhouse 226-227; Store 225, 226
Cannery Row, Monterey, Calif. 456
Cannery Row (Steinbeck) 456
Cannibalism: Mantids 273, **275,** 276
Canning, home: Amish housewife **511**
Cape buffalo: Tanzania **419**
Carannante, Carmine 615, 617
Carbon dioxide lasers 342, 350, 362; Surgical use 352, 353
Carmack, George Washington 80
Carmel Highlands, Calif. 443, **444-445**
Carnelian: Roman ring setting **560**
Carnevale, Giuseppe 619
Carpenter, Frank 233
Carpenter ants: Borneo **776;** Electron micrograph **776-777**
Carpenter tools, Roman **572**
Carriage shop: Lancaster County, Pa. **512**
Carrizo Plain, Calif.: San Andreas Fault **454**
Casa Blanca (mansion), Carpinteria, Calif. 442
Casanovas, Marco Jubés **121**
Case, Dick 822
Castelli, Maurizio **190**
Castle ruins: Hagi, Japan 768-769, 772
Castroville, Calif.: Artichoke festival 442
Catalan (language) 95, 100, 106, 108; Areas where spoken 106, map locating 101
Catalonia (autonomous region), Spain: ***Catalonia: Spain's Country Within a Country.*** By Randall Peffer. Jan., 95-127
Agriculture 108, 113; Farmers **121, 125;** Rice growing **122-123**

Artists 105, 106, 115, 118
Autonomy 101, 113; Loss 95, 113, demonstration commemorating **109;** Restoration 95, 108, 113, 115
Capital *see* Barcelona
Cuisine 95, 120; Characteristics 127
Economy 115; Chemical industry 115
Family traditions 100, **116-117**
Governing body restored 100, 108
Industrialization 113, 115, 123; Oil 124-125
Map 101
National hymn 120
Patron saint 106, 127
Population 95, 101
Repression 95, 100, 101, 105, 110, 115, 120
Separatist movement 95, 100, 113, 115
Soccer 95, 120
Tourism **96-97,** 119, 125, 127
Urban migration 115
Work attitudes 100, 113
Catani, Corrado **186**
Caterpillars *see* Silkworms
Catfish, venomous **472-473**
The Cathedral (underwater chamber), South Australia **130-131,** 132, 138
Cat's cradle (game) **531**
Cattle: Foot rot 160, 175
Cattle industry: Trans-Pecos, Texas 214, 223, 227, 228
Caubet, Rosendo **117**
Caulfield, H. John: ***The Wonder of Holography.*** Mar., 364-377
Cave Divers Association of Australia 133, 141
Caves, underwater *see* Sinkholes
Cederholm, Jeff 669
Centeno, Juanita 433-434, **457,** 461
Central (coffeehouse), Amman, Jordan 242-243
Chagluak, Ben: Moving of house **832-833**
Chagluak, Gabriel 823
Chakuchin, Bruno 822
Chalk Point Generating Station, Md. **552-553**
Chambers, Johnnie 226, 227
Chanar, Nancy **826**
Chanar, Nick **830**
Chappelear, Catherine 553
Chappelear, Francis 553, **553**
Charlie, John 816
Chatry, Fred 154
Cheese: Italy **191,** 200
Chemical industry: Tarragona, Spain 115
Chemistry: Laser applications 336, 343, 348, 353, 355
Chen Yuanguang 305
Chen Yuenkai **290**
Chengdu, China: Free markets 291
Cheremeteff, Regina **389**
Cherry blossoms: Verona, Italy **190-191**
Chesapeake Bay, and region, Md.-Va.: ***Lord of the Shallows–The Great Blue Heron.*** By Richard J. Dolesh. Apr., 540-554
Chessmen: Full-color hologram **367**
Chianti Classico (wine) 187, 207
Chianti region, Italy: Winemaking **190,** 207
Children's Hospital, Los Angeles, Calif.: Laser use **344**
Chili cook-off: Terlingua, Texas 229-230
Chilkat River, and valley, Alaska: Bald eagles 65, **68-69,** 70, preserve 68, 70
Chilkoot Pass, Alaska-British Columbia **85;** Gold prospectors 81, 82, **85**
Chimbote, Peru 170
Chin-strap penguins **638-639**
China: Han Dynasty 290, 291; Long March (1934-1935) 284-285, 304; Pest control 783; Silk weaving 26, 27; Silkworm-raising guidelines 15; *see also* Silk Road
China, People's Republic of: ***Peoples of China's Far Provinces.*** By Wong How-Man. Mar., 283-333
Accommodations: Chinese Army outposts 293; Guesthouse (Lhasa) 294; Hostels 294, 312
Army: Civilian services and occupations 293, 301
Autonomous regions *see* Guangxi Autonomous Region; Xizang Autonomous Region
Closed areas, largely 283
Communes: Minority groups 291, 296, **302,** 317
Cultural Revolution 287, 303, 312, 330
Free markets 291
Government: Ethnic minorities and 288, 290, 291, 305, 309, 315, 333
History: Long March (1934-1935) 284-285, 304; *see also* Cultural Revolution, *above*
Map (central China) 286-287
Minority groups: Number recognized 288, 290; Origin of 290; *see also* Bouyei; Dong; Gē; Miao, *outlined;* Mulam; Muslims, Chinese; Qiang; Tibetans, *outlined;* Tu; Yi
Population 287; Han percentage 287; Minority groups 288, 290
The press and 287
Private-plot farming 291
Railroad terminus: Central China 301
Roads and road construction **284-285,** 286, 293, 300, 301, **314;** The High Road 286; Quagmires **294-295,** 295, 300
Solar heating 294, **302**
Truck convoys (Golmud-Lhasa) **294-295,** 295, 301; Fueling of 301
Wildlife 300, 323
Silk–Queen of Textiles. By Nina Hyde. Jan., 3-49
China Silk Corporation, Hangzhou, China: Embroidery **2-3**
China's Remote Peoples. By Wong How-Man. Mar., 283-333
Chinese: Canada 379, 382, 390; Folk medicine: Mantid remedies 273, rhino-horn preparations **410;** Minority groups: ***Peoples of China's Far Provinces.*** By Wong How-Man. Mar., 283-333
Chinese Immigration Act (Canada): Repeal 382
Chinese mantises **270;** Egg case **276;** Mating **274-275;** Nymph **272**
Chinook (wind) 387
Chinook salmon **665**
Chitawan Valley, Nepal: Rhinoceroses 417-418; *see also* Royal Chitawan National Park
Chittagong, Bangladesh 704, 742, 743
Chobe National Park, Botswana: Drought 178, 181; Elephants 178, **180,** 181
Choeradodis rhombicollis (mantis) **278**
Chonganjiang, China 315
Choshu (feudal domain), Japan 751, 755, 760, 771, 772; *daimyo* (feudal lord) *see* Mori family; *see also* Hagi, *outlined*
Christian Democratic Party: Italy 188, 206
Christianity: Japan (16th century) 756, rejection of (17th century) 756; *see also* Amish; Mennonites
Christmas Island, Pacific Ocean: Decline in bird population 170-171
Chu tomb: Hubei Province, China 26
Chuck-wagon race: Calgary Stampede **398-399**
Chumash Indians: California 433-434, **457,** 461
Chunchi, Ecuador: Mudslide victims **166**
Churches and cathedrals: Barcelona, Spain **104, 105;** Naples, Italy 617, 618, **618;** Pozzuoli, Italy **625;** Sitka, Alaska 70-71, **83;** Vatican City **188**
Churchtown, Pa. **500-501;** Mennonite meetinghouse **500**
Cigarette smuggling: Naples, Italy **196-197**
Circus performance: Port Townsend, Wash. **656**
Clark, Eugenie **491;** ***Japan's Izu Oceanic Park.*** Apr., 465-491
Clark, John 779
Clark, William 438
Clarks Point, Alaska: Salmon industry 817, 831; Steam bath **830**
Cleaner wrasse **486**
Clearwater River, Wash. 669

Climate: ***El Niño's Ill Wind.*** By Thomas Y. Canby. Feb., 144-183
Clock, silk velvet **40**
Cloth press: Herculaneum, Italy **592**
Clothing and costume: Japanese bride **766; *Peoples of China's Far Provinces.*** By Wong How-Man. Mar., 283-333; Shinto festival dancers **760-761; *Silk–Queen of Textiles.*** By Nina Hyde. Jan., 3-49
Cloud and Dragon commune, Hangzhou, China 15
Coat and waistcoat, embroidered **11**
Cobal (government store), Cumaru, Brazil **686**
Cobb, Jodi, photographer: ***Jordan: Kingdom in the Middle.*** Feb., 236-267
Cockroach: Army ant diet **801**
Cocoons, silkworm **4-5, 6-7,** 14, 15, **34;** Formation 14, **25;** Processing 7, 15, 18, 19, 26, **28**
Codorniu (sparkling wine producer) 124-125; Harvest **124-125**
Cody, John 450, 452-453
Cohen, Shlomo 266
Colbert, Jean-Baptiste 39
Colonial America: Sericulture 12, 40, 42
Colorado River, U. S.: Floods 155, 160
Colosseum, Rome, Italy **202-203**
Communes, Chinese: Minority groups 291, 296, 303, 317; Mulberry-tree farming **22-23;** Silk workers **4-5,** 15, **22-23, 35**
Communist Party: Italy 188, 192, 206, demonstration 205, 206, May Day parade **189**
Como, Italy: Silk industry 37, 43, 48
Computer applications: Computer-aided learning **64, 826;** Geophysical exploration 400; Hologram generation 367, 370; Looms 48; Surgery **391;** Universal Product Code scanner 366, **374-375**
Computers: Optoelectronics 336, 363
Congolli (fish) **136**
Constantinople: Silkworm eggs, introduction of 30
Continental drift 343; Laser measurements 342-343, 361
Contini, Bruno 193
Contor, Roger 662, 667
"Conversation" (statue) **384**
Cook: *Great Indian Rover* (train) **726**
Cooper, K. E. 400
Cooper, Rhys 43
Cooper, Robert 362
Copperheads (missiles) **359**
Coral reefs, death of 155, 168, **168-169,** 171
Corals: Izu Oceanic Park, Japan **465-469, 478-479, 484-485**
Cortina d'Ampezzo, Italy **200-201**
Costa Brava (region), Spain **96-97;** Aerial view **118-119;** Tourism 125, 127
Cottage industry: Silk weaving: India 19, **30,** Japan 19, 26
Cotton: Bollworm control **273**
Cottonwood trees **68-69**
Coulson, Cotton, photographer: ***Surviving, Italian Style.*** Feb., 185-209
Cowan, Robert L.: Quoted 214
Cowboys: Trans-Pecos region, Texas **210-211,** 220
Crabs: Pelagic red 632, 633; Spider **488-489,** 489-491, **491**
Craft, Kinuko Y., artist: ***Hagi: Where Japan's Revolution Began.*** June, 751-773
Crane pattern: Tie-dyed silk **46;** Detail **47**
Crayfish: Australian sinkholes 142, **142**
Credit cards: Holograms 367, 374, 375, **375**
Cremona, Italy: Violin-making 187, 207-208
Criminology: Laser applications 335, **353**
Cross, A. E. 402
Cross imprint: Herculaneum, Italy **592**
Crowfoot Sunrise Residence, Calgary, Alberta, Canada **390**
Crustaceans: ***Krill–Untapped Bounty From the Sea?*** By William M. Hamner. May, 626-643; Largest *see* Spider crabs; *see also* Crayfish
Crustal Dynamics Project, Goddard Space Flight Center, Md.: Plate tectonics measurements 343
Crustal plates: California 450, 455
Crystal Bar, Alpine, Texas **235**
"Crystal Beginning" (Benton) **367**
Cucumber plants: Jordan Valley hothouse **251**
Cultivator, mule-drawn **504-505**
Cultural Revolution (China) 287, 303, 312, 330
Cumaru (mining complex), Brazil: Gold mines 678, 683, 688; Government store **686**
Currency, U. S.: Holograms 367, 375

D

Dacca, Bangladesh *see* Dhaka
Dadu River, China: Cable bridges **315**
Daggers: Rhino-horn handles **410,** 412, 413, 422
Daimler-Benz company, West Germany: Design laboratory **348-349**
daimyos (Japanese feudal lords) 761, 764, 766-767, 772 *see also* Mori family
Dalai Lama 295, 306
Dalhousie, Lord 744, 745
Dalí, Salvador 106; Sculpture by **107**
Daliang Shan (mountain) region, China: Minority group *see* Yi
Damiya Bridge, Jordan River 242
Dancers and dancing: Ballet class **388-389;** Catalonians **127;** Kayapo Indians **676-677;** Shinto festival participants **760-761;** Spanish dancer **434;** Square dancers **385;** Texans **212-213;** Tu people **300**
Dandong, China: Silk factory 19, 48
Danielsson, Bengt 170
Danish Days festival, Solvang, Calif. 442
Daphne Major (crater), Galapagos Islands **168, 169**
Darjeeling, India 704, 729, **734-735;** Ethnic diversity 736; Rail line 749
Data storage: Hologram applications 370
Davidson, Cameron, photographer: ***Lord of the Shallows–The Great Blue Heron.*** Apr., 540-554
Davis, Jefferson: Laser animation **337**
Dawson, John D. **787,** artist: ***Ways of the Ant.*** June, 779-813
Dawson, Kathleen **787**
Dazhang, China: Tu people 301, 303
The Dead Do Tell Tales at Vesuvius. By Rick Gore. May, 557-613
Dead-leaf mantids **279,** 280
Dead Sea: Salt pans 256, Landsat image **244**
Deathwatch beetles 272
De Caro, Stefano 586, 591
Deer **648**
Defense Advanced Research Projects Agency (DARPA): Laser weapons research 362
De Girolamo, Vittorio 566, **569, 572**
Deir al-Kahf, Jordan: Bedouin settlement 256
Deir Alla, Jordan 248
Delhi, India 704
De Luigi, Ludovico 196, 198
Demonstrations: California 430, **455;** Italy 205-206; Spain **109**
Denisyuk, Yuri 366, 367
Dentist, curbside: Central China **303**
Desert Police: Jordan 253
Design competition: Portable plastic shelters **440-441**
Dhaka (Dacca), Bangladesh: Railyard **740-741**
Di (White Horse Tibetans) 305; Dress, traditional **289;** Legend 305; Population 288; Written language, absence of 305
Diablo Canyon nuclear power plant, Calif. 430, 432, **455**
Diaper Derby (baby race): Monterey County Fair **442**
Diatoms **626-627,** 633, **642**
Diebitsch, Stacie 234

Diesel engines: Laser heat treatments 342
Di Girolamo, Pio 610-611
Discovery (space shuttle) 430; Launch site **458**
Divers and diving: ***Exploring a Sunken Realm in Australia.*** By Hillary Hauser. Jan., 129-142
Dogsleds: Greenland **522-523,** 539, cover
Doiron, Daniel **347**
Dolan, Leslie and Tom 823
Dolesh, Richard J.: ***Lord of the Shallows–The Great Blue Heron.*** Apr., 540-554
Doll, Don, photographer: ***Eskimo Hunters of the Bering Sea.*** June, 814-834
Doll, dressmaker's **39**
Dolomite Mountains, Italy **200-201**
Dolphin, Bill 93
Dong (people): Dress, traditional **289;** "drum towers" 328, **330, 331;** Festivals 288, 328, 332; Legend 332; Population 288, 328; "wind-and-rain" bridges 328, **332-333**
Dongshan People's Commune, China: Silk workers **4-5**
Doubilet, Anne **130, 133**
Doubilet, David, photographer: ***Exploring a Sunken Realm in Australia.*** Jan., 129-142; ***Japan's Izu Oceanic Park.*** Apr., 465-491
Douglas-Hamilton, Iain 405-406
Dove: Hologram of **375**
Dover, Mary 382, **397,** 401-402
Doyle, Robert E.: Memorial tribute 695
Dragon, silk (embroidery) **2-3**
Dragon Boat Festival: Hei Miao people 327-328, **328-329**
Drama, Tibetan **311**
Dressmaker's doll **39**
Drever, Ronald 363
Droughts: ***El Niño's Ill Wind.*** By Thomas Y. Canby. Feb., 144-183
"drum towers": Dong (people) 328, **330, 331**
Dry, Dan, photographer: ***Texas West of the Pecos.*** Feb., 210-235
Duckweed **132-133**
Dufferin Bridge, Varanasi, India 722
Dugouts: Dragon boats 327-328, **328-329**
Dune cycles: Pismo Dunes State Vehicular Recreation Area, Calif. **456-457**
Dunn, Bill 80
Dúran, Ecuador: Mudslides 160
Dutch colony, 19th-century: Japan 756, 765
D'Vincent, Cynthia 88
Dyes: Laser mediums **338,** 341, 355; Water-tracing **140-141**

E

Eagle Tlingits (Indians) 71; Shaman **75;** Totem **71**
Eagles *see* Bald eagles
Earrings, gold: Herculaneum, Italy **560, 561,** 595, cover
Earth uplift: Pozzuoli, Italy 615, 617, 618, 619, 624
Earthquakes: Bay of Naples region, Italy 192-193, 572, 574, 584, 587, Gulf of Pozzuoli 615, 617, 618, 619, 624; California 430, 434, 443, 450, 452, 455
East Ghor Canal, Jordan 248, 249, 250
East India Company 734; Charter 744; Government of India 744
East Indian Railway 745
East of Eden (Steinbeck) 430, 453, 456
East of Eden: California's Midcoast. By Harvey Arden. Apr., 424-461
East Wahdat (townsite), Amman, Jordan 248
Eaton's (department store), Calgary, Alberta, Canada **385**
Ebro River Delta, Spain: Oil prospecting 125; Rice growing **122-123**
Ecuador: El Niño effects **146-147,** 155, 160, **166,** 167
Edwards, Michael 352
Eels, moray **465-467, 486-487**
Egan, William A. 56
Egg baskets: Ge people **326**
Egg McMuffin (sandwich): First served 443
Egyptian workers: Jordan **241,** 243
Eidetic Images, Inc., Elmsford, N. Y.: Hologram mass-produced by 372, cover
Eight Mile Creek, South Australia 134; Drainage 138
Einstein, Albert: Prediction of gravity waves 363; Prediction of stimulated emission of radiation 335, 336
Ekuvukeni, South Africa: Drought **182-183**
Elagabalus (Roman emperor) 30
El Camino Real (the Royal Highway), Calif. 442
El Chichón (volcano), Mexico 182; Dust 153
Electromagnetic spectrum 338; Diagram **338**
Electron micrographs: Ants **776-777**
Electrons: Lasers, role in 336, diagram **340**
Elephant Island, South Shetland Islands: Soviet trawlers **633,** 641
Elephants, African 178, **180,** 181, 406, Feb. cover
Elfin Cove, Alaska 65; Residents **64**
Elizabeth I, Queen (England): East India Company charter 744
Elks: Olympic Peninsula, Wash. 648, **673**
Ellis, William S.: ***Surviving, Italian Style.*** Feb., 185-209
El Niño current: ***El Niño's Ill Wind.*** By Thomas Y. Canby. Feb., 144-183
Bushfires 171, 174, **176-177;** Deaths 174, 176
Climate, effects on 151, 152-153, 181
Coral reef deaths 155, 168, **168-169,** 171
Deaths 146, 153, 155, **166,** 174, 176
Droughts 148-155, 171-183; Animals slaughtered because of 152, **152,** 153; Livestock killed by **174;** Wildlife stricken by 153, **173, 175,** 178, **179, 180,** 181
Dust storms **150-151,** 153, 155, 171
Evolution 181-182
Financial losses 146-147, 153, 155, 160, 167, 171, 175
Floods **146-147,** 154, 155, **156,** 160, **160-161,** 167, 175
Food chain disruption **164,** 167, 170
Homeless 160, 167, 170, 173, 174, 176
Kelvin waves **162-163,** 163, 181
Maps: Regions affected 154-155; Sea-surface warming 154-155, 163
Marine life disturbed 154, 155, 164, **164,** 167, 168, **168-169,** 171
Mechanism 152-153, 181; Diagrams **162-163**
Name origin 147, 152
Past occurrences: 1972 167; 1976-1977 153, 159, 160, 182
Sea level raised by 154, 181
Sea-surface warming 153, 160, 167, 170, 171, 181; Maps 154-155, 163
Seabirds affected by 154, 155, 167, 168, **169,** 170, 171
Storms **144-145,** 154, 155, 156, **156-159,** 167, 170, 181
El Paisano Hotel, Marfa, Texas **228**
Embroidery **2-3, 11, 16-17, 18;** Automation of 48; Hei Miao **289,** 313
Endangered species: ***They're Killing Off the Rhino.*** By Esmond Bradley Martin. Mar., 404-422
Endoscope 346, **346**
Ercolano, Italy: Aerial view **582-583;** Residents 572, **585, 591, 612-613;** Trellised fields **582-583, 587;** *see also* Herculaneum, *outlined*
Eri silkworm: Silk, quality of 14
Erosion control: Lumber industry 668-669, 670
Eskimo Hunters of the Bering Sea. By Brad Reynolds. June, 814-834
Eskimos: Alaska *see* Yupik Eskimos; Greenland *see* Inuit
Ethnology: ***Peoples of China's Far Provinces.*** By Wong How-Man. Mar., 283-333; *see also* Inuit; Yupik Eskimos
Etna, Mount, Sicily: Eruption 196
Etro, Gerolamo 48

Euphausia pacifica (krill shrimp): Fish food **634,** 640; Food item, unpopular **634,** 640; Harvesting **634-635,** 640
Euphausia superba (krill shrimp): ***Krill–Untapped Bounty From the Sea?*** By William M. Hamner. May, 626-643
Anatomy **630,** 633
Areas of concentration (map) 632
Defense mechanism 627, **630**
Feeding behavior 627, 630, 633, 636, 642; Food **626-627,** 633, **642, 643,** winter food 642
Food source, Antarctic wildlife's 627, 630-631, 632-633, 636, 639, 642; Fisheries a threat to 633, 642
Harvesting **633,** 640-641, 642
Life cycle 636
Mating season 636; Mating 636, 637
Molting 636; Defense mechanism 627, **630**
Nauplii (larvae) 636, **637**
Resource estimates 631, 632, 642
Schooling behavior 627, 636; Density of schools 627, **628-629,** 630, 632, 636
Size 627, 636
Spawning season 636, 637, 642; Eggs **637,** fertilization of 637, number produced 636, 637
Europe *see* Italy; Spain
European wood ants: Mounds **812-813,** 813
"Eurowine" 207
Evans, Max 668
Ewens, Thomas 134
Ewens Ponds, South Australia: Animal life 138, **142;** Currents 134, 141; Plant life **134-138,** 141, photosynthesis 138, **139;** Water exchange rate study **140-141,** 141
Excimer lasers 348-349, 352; Art restoration experiments **342**
Exciton Chemical Company, Ohio: Fluorescent dyes **338**
Executive Flight Centre, Ltd., Calgary, Alberta, Canada **396**
Exploring a Sunken Realm in Australia. By Hillary Hauser. Jan., 129-142
Eye surgery: Laser uses **344-345**

F

FBI: Laser applications 335
Fabre, Jean-Henri: Quoted 268
Fair, Florence **513**
Faires, Joe 662
"Faizabad Loop" (train route), India 720
Far West, The Making of America map series. Apr. supplement
Farallon Islands, Calif.: Seabird mortality 154
Farms and farming: California **426-427,** 453, 456; Catalonia **122-125;** Central China 290, 291, **292;** Jordan 248, 249, **251,** 256, 258, 261; ***The Plain People of Pennsylvania.*** By Douglas Lee. Apr., 492-519
Fashion industry: Italy 186, **186,** 187, 201, **201,** 205; Silk, use of 14, **38,** 48
Faults, seismic: California 430, 449, 450, **454,** map 432-433; Italy 574
Federal job-training program: Monterey, Calif. 456, 458
Feed, animal: Krill 630, 633, **634,** 640; Silkworm feed, artificial 14
Felipe, Brother 100
Fellini, Federico 207
Feng Youxian 37, 43, 45
Fengxiang, China 315, 317, 320, **326-327;** Conservation program 320, 326
Feni, Bangladesh: Flooding 742
Ferrari (sports car) **198-199,** 205
Ferris, Jim **660**
Festivals: China **30,** Dong people 288, 328, 332, Hei Miao people 327-328, **328-329,** Tibetans **306, 310-311;** Japan **760-761, 770-771;** Spain **126**
Fetus, human: Skeleton **564,** 570
Feudalism: ***Hagi: Where Japan's Revolution Began.*** By N. Taylor Gregg. June, 751-773; *Japan; Historical Japan.* June supplement
Fiat company: European sales 186, 198; Labor strife 206; Robotized assembly line 187, 206
Fiber optics: Lasers 336, **344,** 346, **347,** 363
Fiery Fields region, Italy 617, 620 *see also* Phlegraean Fields Caldera
Figueras, Spain: Museum **107**
Film industry: Italy 207
Fingernail weaving 19, 26, **44;** Notched fingernails 26, **45**
Fingerprints: Laser detection 335, **353**
Finney, Don 82-83
Fiorelli, Giuseppe 591
Fir trees **649,** 652, 653
Fish farming: Krill feed 630, **634,** 640
Fish meal: Warehouse **164-165**
Fishes: ***Japan's Izu Oceanic Park.*** By Eugenie Clark. Apr., 465-491; *see also* Halibut; Herring; Salmon; Trout
Fishing: ***Eskimo Hunters of the Bering Sea.*** By Brad Reynolds. June, 814-834
Fishing boats: Beached **165;** Krill fishing **633, 634-635,** 640-641
Fishing industry: Japanese marine parks 474-475; ***Krill–Untapped Bounty From the Sea?*** By William M. Hamner. May, 626-643; Olympic Peninsula, Wash. 653, 665, 668-669, 672; Peru 167, 170; Southeast Alaska 53, 56, 61, 72, **78, 79;** Washington fishing industry: Boldt decision (1974), effect of 669, 672
Fjords *see* Hood Canal, Wash.; Inglefield Fjord, Greenland; Lynn Canal, Alaska
Fleming, Rex J. 181, 182
Fleming, Tamika **514**
Flight Dynamics, Inc., Hillsboro, Oreg.: Head-up display manufacturer 377
Floods: ***El Niño's Ill Wind.*** By Thomas Y. Canby. Feb., 144-183
Florence, Italy 198, 205-206, 208
Florez, Raul **218,** 234
Flower seed cultivation: Lompoc Valley, Calif. **426-427**
Flowers, artificial: Silk petals **36**
Flowery Miao (people) **288;** Dress, traditional **288**
Folk dancing: Catalonia **127**
Folk medicine: Faith healer 227-228, **231,** 233; Mantid remedies 273, **280;** Rhinoceros products **407, 410,** 411, 417, 422
Folk music: Catalonia (region), Spain 120
Fomblin Y Met (preservative agent): Marble sculpture 208
Fontainebleau Palace, France 40
Food chain: Krill 633; Peru Current **164,** 167, 170; Phytoplankton 138, 633
Foot rot: Cattle 160, 175
Foothills Hospital, Calgary, Alberta, Canada **391**
Forks, Wash. 652, 667, 670; Logging contest **658-659**
Formic acid: Ants 782, 783, 787, 793, 807
Formica sanguinea (ant): Parasitic beetles **810**
Fort Davis, Texas 228-229
Fort Stockton, Texas 224, 233, 234
Fox, Rodney **128, 130, 135**
France: Silk industry 12, 37, 39, 40, haute couture 14, **38**
Franceschi Park, Santa Barbara, Calif. 449
Francis I, King (France) 39
Franciscan missions: California 434, **434, 435**
Franco, Francisco 95, 100, 113; Repression of Catalans 95, 100, 101, 105, 110, 115, 120
Franklin, Benjamin: Quoted 370
Franks, Nigel 801
Frass (silkworm waste): Uses for 15
Frederick Sound, Alaska **50-52,** cover; ***An Incredible Feasting of Whales.*** By Al Giddings. Jan., 88-93
"free-electron" lasers 343, 348
Fresco River, Brazil 675; Aerial view **678-679;** Pollution 678, 683
Fresh Air Fund: Beneficiary **514**
Freshwater sinkholes: ***Exploring a Sunken Realm in Australia.*** By Hillary Hauser. Jan., 129-142
Fuca, Juan de 659, 662
Fuentes, Javier 115
Fuller, Terry 352
Fumaroles: Pozzuoli, Gulf of, Italy **620,** 623

Fumi Maru No. 18 (krill-fishing boat) **634-635,** 640
FUNAI *see* National Indian Foundation
Fungus cultivation: Ants **796,** 800
Fusion, nuclear: Diagram **355;** Fuel pellets **355,** 357, 362; Lasers used 336, 355, 357, 362
Futbol Club Barcelona (soccer team) 95, 120; Flags **94-95**

G

Gabor, Dennis 366
Galapagos Islands: Boobies, blue-footed **168;** Effect of El Niño current **169**
Galaxiids 136
Gallini, Giuseppe 198
Gallium arsenide crystal 355
Gandino, Italy: Silk vestments, preserved 36-37
Ganga-Yamuna Express (train) 718
Ganges (river), India: Ritual bathing 721
Gansu Province, China: Dentist, curbside **303;** Lamasery *see* Labrang Lamasery; Minority group *see* Hui; Solar reflector **302;** Tibetan burial site 304-305
Garcia, Walter 167
Garimpo Kayapo (mining site), Brazil 675, 682, **682,** 690
Garwin, Richard 363
Gaudí, Antonio 105; Church designed by **104, 105**
Gaya, India 723
Gazankulu homeland, South Africa: Drought 176
Ge (people) 315, 317, 320, **324-325, 326;** Classification 283, 317; Dress, traditional **282,** 315, **324-325;** Village **326-327**
General Motors: Laser uses 342, **348,** 355
General store: Hinkletown, Pa. **512-513**
Generalitat (Catalonian governing body): President 109; Restoration 100, 108
Gennaro, San 191, 615, 617, 618
Geology *see* Earthquakes; Faults, seismic; Volcanoes
Geophysical exploration: Computer applications 400
George, Saint: Feast day 106, 127
George Jim (Tlingit) **75**
Ghum, India: Railroad station 729
Giddings, Al: ***An Incredible Feasting of Whales.*** Jan., 88-93
Gilmer, Ron 630
Giovanni, Pirro **612**
Gispert, Montserrat 108, 113
Givenchy, Hubert de 14, **38**
Glacier Bay, Alaska **53-55,** 75
Glacier Bay National Park, Alaska **53-55,** 75
Glaciers: Alaska **54-55;** Greenland 520, 526, 530, 535, 538; Olympic Peninsula, Wash. **650-651,** 652, 662
Glaucoma: Laser treatment 345
Glenbow Museum, Calgary, Alberta, Canada 390, 402
Global O.A. Systems Inc.: Hemodynamic tracking system **391**
Global Weather Disaster (El Niño current). By Thomas Y. Canby. Feb., 144-183
Glover, Randy **235**
Glowing avalanches (volcanic phenomena) 569, 607, 623; Vesuvius 566, 569-570, 575, **577,** 588, 591, 607, 610
Glynn, Peter W. 168, 171
Goatherd: Jordan **258**
Goby **486**
Gold mining: Brazil: Kayapo Indian lands 675, 682, **682,** 683, 688, 690, sites 678; Methods **682,** 683, 694
Gold strikes: Alaska 62-63, 80; Klondike gold rush 80-81, 82, **85**
Goldfish (silk embroidery) **16-17**
Golmud, China 301; Kazaks 296, **298**
Golmud-Lhasa road **294-295,** 295, 300
The Gong Tung Sang (living Buddha) **306**
Gore, Rick: ***The Dead Do Tell Tales at Vesuvius.*** May, 557-613; ***A Prayer for Pozzuoli.*** May, 615-625
Gorgonian (coral) **484-485**
Gorotire (village), Brazil: ***Brazil's Kayapo Indians, Beset by a Golden Curse.*** By Vanessa Lea. May, 675-694
The Grapes of Wrath (Steinbeck) 437, 456
Grasshoppers: Mantid prey **270,** 273
Grave goods: Chu tomb silks 26
Graves, Robert: Quoted 564
Gravina Island, Alaska **86-87**
Gravity waves 363; Laser detector 363
Gray whales: Krill feeding 632
Great blue herons: ***Lord of the Shallows–The Great Blue Heron.*** By Richard J. Dolesh. Apr., 540-554
  Calls 541, 543
  Colonial nature 541, 542
  Defense 540, 541, 547, 552
  Diet 540, 541, 545, 548, 554
  Eggs: Incubation 543, 549; Number 543, 549; Theft of 554
  Fishing techniques 541, 545, **548, 552,** 554
  Flight 541, **550,** 551, 552
  Heronries protected 545, 554
  Hunting 545, 548
  Juveniles: Departure from heronry 551; Sexual maturity 551
  Man, tolerance of 545, 552, 553, **553**
  Mating: Assembly of colony **542-543,** 549; Coloration 549; "Howling" 543; Ritual posturing 542, 549; Stretch display **543**
  Nests: Colonies 541, **542-543, 544;** Privacy 542-543, 549; Selection for mating 542, 549; Strength 541, 545, 549
  Range 540, 541
  Size 540, 541
  Threats to: Food supply, loss of 545, 554; Man's encroachment 540, 545, 554; Nesting trees, destruction of 545, 554; Predators 541, 551, 554; Storms 541, 545, 549, 554
  Young: Down **546-547;** Enemies 541, 551; Feeding 543, 549, 551, **551;** Flight 549, 551; Infant mortality 548, 549, 551; Self-defense 541, 547
Great Indian Peninsula Railway 745
Great Indian Rover (train) 727; Cook **726**
Great Rift Valley, Africa-Asia: Landsat image **244**
Green River, Utah: Junked-car riprap **161**
Greenland: ***Narwhal Hunters of Greenland.*** By Ivars Silis. Apr., 520-539
Gregg, N. Taylor: ***Hagi: Where Japan's Revolution Began.*** June, 751-773
Gregory, Bishop 70, 71, **83**
Grisdale, Camp, Wash. 668
Guangxi Autonomous Region, China: Minority group 333; "wind-and-rain bridge" **332-333**
Guayaquil, Ecuador: Floods 146, 160, 167
Guizhou Province, China: ***Peoples of China's Far Provinces.*** By Wong How-Man. Mar., 283-333
Gul, Ziarat 705
Gush Emunim ("bloc of the faithful"): Hebron, Jordan 262
Gustavus, Alaska 80
Gynecological surgery: Lasers used in 352-353
Gypsy moths: Defoliation by (1982) 42; Introduction of 42

H

HPD (hematoporphyrin derivative): Cancer treatment 345, 353; Laser activation **344,** 345, 353
Haddadin, Munther 248, 249
Hagi, Japan: ***Hagi: Where Japan's Revolution Began.*** By N. Taylor Gregg. June, 751-773
  Accommodations 755
  Castle ruins 757, 760, 768-769, 772
  Festivals **760-761, 770-771**
  Garden **762-763**
  Historic sites **758-759,** 760, **766-771,** 772; Map 757
  Museum **756,** 760
  Population 757
  Rebellion, 19th-century 752, **753-754,** 755, 758, 770-772
  Tourists 757, 760

Walls, 17th-century **768-769,** 772
see also Shoka Sonjuku (school)
Haines, Alaska: Residents **50,** 61
Haleakala Observatory, Maui, Hawaii: Laser-ranging station **361**
Halibut: Dressed **78;** Narwhal predation 520, 523
Hall, Alice J.: ***Ways of the Ant.*** June, 779-813
Hall, Dianne 395
Hallam, Neil **138,** 141
Hamamrah brothers: Farm 261-262
Hammond, Jay 75
Hamner, William M.: ***Krill–Untapped Bounty From the Sea?*** May, 626-643
Hamzah, Prince (Jordan) **252**
Han Chinese: History 290, 291; Minority groups and 304, 308, 319, 325, 333; Population 287
Hangzhou, China: Historical museum 27; Silkworm raising 15, 18
Hangzhou Silk Factory: Yarn production **28-29**
Hanson, Roger 668
Harley Davidson motorcycle: Calgary beauty salon **401**
Harpoons: Narwhal hunting 520, **529,** 530, **533,** 538, 539; Seal hunting **521**
Harris, Sondra **232**
Harrison, Dudley 230-231, 234
Harvester ants: Mating frenzy **790-791,** 800; Queens **790-791, 792, 793,** 800; Workers 793, **793**
Harvie, Eric 390
Hashemite Kingdom of Jordan *see* Jordan
Haskins, Caryl P.: ***The Ant and Her World.*** June, 774-777
Hauser, Hillary **133;** ***Exploring a Sunken Realm in Australia.*** Jan., 129-142
Haute couture 187, 201, 205; Silk, use of 14, **38,** 48
Hazrat Nizamuddin, India: Railway station 716
Head-up displays (aviation) **376, 377**
Headdresses: Beeswax **684, 685;** Makah Indian costume **663;** Parrot feathers **680, 681, 689**
Heald, Carol 176
Hearst, William Randolph: Estate 443, **450-451, 452-453**
Hearst, William Randolph, Jr. **452**
Heath, Russell **81**
Hebron, Jordan: Sectarian strife 262, 266; Tomb of Abraham 262, **266-267,** 267
Heda, Japan **490-491**
Hei Miao (people) **289,** 313, 320, 323, 325; Festival 327-328, **328-329;** Subgroups 321, 323 *see also* Mpeo; River Hei Miao
Heimbecker, Philip L. and Gayadelle **396**
Heiro Kitagawa 46
Helicopters: Attack helicopter **358;** Logging operations 668
Helium-neon lasers 336, 341, **351, 368-369;** Surgical guides 352
Hellfire missiles: Laser guidance **359**
The Helmsman (skeletal remains): Herculaneum, Italy 570, 581, 599, **605,** 607, 610; Analysis of bones 599, 604; Artist's conception of **604-605**
Herculaneum (ancient town), Italy: ***The Dead Do Tell Tales at Vesuvius.*** By Rick Gore. May, 557-613
Abandonment theory 569, 570, 581
Aerial views **581, 582-583;** Artist's conception **578-580**
Anchor remnant **603**
Basilica **578,** 610, 613
Bathhouse **580, 581,** 594, 606
Boat 557, 570, 571, **602-603,** 604, 606-607, 610, 611
Busts and statues 566, 569, 581, 595, **598-599, 610,** 613
Destruction of (A.D. 79): Timetable of volcanic events 566, 571, 575, 577; *see also* Volcanic deposits, *below*
Discovery of ruins (1709) 566, 569; Damage occurring with 565, **569**
Home furnishings **565, 592-593,** 595
Jewelry 557, **560-561, 563,** 570, **591,** 595, 598
Layout of town **578-580;** Key **581**
Looting of site 566, 569, 595, 596, 613
Map *see* Layout of town, *above*
Papyrus scrolls 595, 596, **600-601**
Population 595
Seawall **571, 579-580, 581;** Chamber excavations 557, **562,** 569, 570, **570,** 571, 581, 595, 607, 611
Skeletons **556, 558-560, 562, 563, 564, 570,** 570-571, **572, 605;** Analysis 560, 564, 588-589, 595, 598-600, 604, 606; Number discovered 558; Processing of **586-587,** 611; Well-preserved condition 570, 587, 595
Theater 566, **569,** 595, 613; Artist's conceptions **566-567, 578;** Capacity 566, 581; Face imprint in corridor 566, **568,** 613
Tools 557, **572**
Volcanic deposits: Depth of burial 569, 575; Force behind *see* Glowing avalanches; Preservation by 592; Strata 575, **576, 577,** 607; Study of 571, **576,** 607
Heritage Savings Trust Fund: Alberta, Canada 400
Hero (research vessel) 631, 641
Hero (sloop) 632
Herodium (fortress), Jordan **260;** Jewish defenders 260
Herons *see* Great blue herons
Herring: Humpback whale feeding 88, 90, 93; Yupik Eskimo diet 816, 817, 819, 822
Hershey, Susan **496**
Hezuo, China: Tibetan "sky burials" 304-305
Hideyoshi (Japanese warlord) 756
Highwayman beetles: Ants and **808-809,** 811
Himalayan foothills: India **698-699**
Hinduism: Nepalese rite 417-418
Hindus: Varanasi, India 721
Hinkletown, Pa.: General store **512-513**
Hippopotamuses: Botswana 178, **179**
History, U. S.: *Alaska,* The Making of America map series. Jan. supplement; Colonial America 12, 40, 42; *Far West,* The Making of America map series. Apr. supplement
Hmong (people): Origins 288, 308
Hodges, Jack **69**
Hoh River Valley, Wash. **646-647,** 654, 663
Hölldobler, Bert **787;** ***Ways of the Ant.*** June, 779-813
Hollister Hills State Vehicular Recreation Area, Calif. 449
Holloway, Allen **347**
Holocamera 368, **368-369**
Holograms 335, 336; ***The Wonder of Holography.*** By H. John Caulfield. Mar., 364-377
Art **364-365, 367;** Preservation 366
Color, natural 367, **367**
Commercial applications 366, 367; Credit cards 367, 374, 375, **375;** Product-code scanners 366, 374, **375,** diagram **374**
Computer generated 367, 370
Currency, proposed use on 367, 375
Head-up displays (aviation) **376, 377**
History 366
Industrial applications 366, 370; Holographic interferometry 368, **368-369**
Lasers used in 366, 367, 368, **368-369,** 370, **371,** 372, **373**
Mass produced 367, 372; Making of 372, **372,** diagram **373**
Mechanics of 366, 370; Diagram **371**
Military applications 370
Name origin 366
Production of 366, 370; Diagram **371**
Rainbow **367;** Making of 372, diagram **373**
Research applications 367, 370
Three-dimensional views 365, 366-367, 370
White-light viewing 372; Diagram **373**
Holographic interferometry 368, **368-369**

Holographic optical elements 366, 374
Holy Land *see* Jordan
Holy Week procession: Tarragona, Spain **112**
Honey ants: Honeypots **802,** 803, **805,** 811; Slavery 804, 811; Tournaments, ritualized 803, **804-805,** 811
Honeydew: Ants collect **784,** 794, 803
Honeypots (ants) **802,** 803, **805,** 811
Honshu (island), Japan *see* Hagi; Izu Oceanic Park
Hood Canal (fjord), Wash. 652, 666
Horse breeding: California 442, ranch **459**
Horses: Calgary **378-379, 398-399, 402-403;** California **448, 459;** Lancaster County, Pa. **492, 500-501,** 519; Texas **210-211, 232**
Hosea (prophet): Traditional tomb 267
Hot springs *see* Thermal springs
Hotan, China 13; Tie-dye design **9, 30;** Uygur women **8-9, 30**
Hotchkiss, Harley 395
Hotel Aiguablava, Aiguablava, Spain 125, 127
Hothouses: Jordan 249, **251**
Household in Flight (skeletal remains): Herculaneum, Italy 570, 581, 595, 598, 607, 611
How a 38,000-mile Lifeline Grew (Indian railways). By Michael G. Satow. June, 744-749
Howard, Frances "Nellie" 225-226
Howrah, India: Station 725, 727, **732-733**
Huangguoshu (waterfall), China **322**
Hudson's Bay Company store, Calgary, Alberta, Canada 382, **384**
Hughes Research Laboratories, Calif.: Laser annealing **339**
Hui (people) 303, 304; Commune **302;** Raft builder **304**
Human pyramid: Catalonia region, Spain **126**
Hummingbird: Attack by mantis 275-276
Humpback whales: ***An Incredible Feasting of Whales.*** By Al Giddings. Jan., 88-93; Krill feeding 636
Hunting the Greenland Narwhal. By Ivars Silis. Apr., 520-539
Hurricane Ridge, Olympic Peninsula, Wash.: Wildlife **648**
Hussein bin Talal, King (Jordan) 242, 243, 248, **253**
Huxley, Julian 273
Hyde, Nina: ***Silk–Queen of Textiles.*** Jan., 3-49
Hymenopus coronatus (mantis) **268-269**

I

IBM: Universal Product Code scanner 374, **375**
Ibrahim, Hassan 257-258
Ice, Arctic: Breakup in summer 520, 522-523, 526-527, 531; Dogsled crossing **522-523,** cover
Ice hockey: Calgary, Alberta, Canada 395, 400
Icebergs: Antarctic Regions **638-639;** Greenland 531, 535
Ihme, Craig 400
Ikat: China 8-9; India 19, 30
Iman, Princess (Jordan) **253**
An Incredible Feasting of Whales. By Al Giddings. Jan., 88-93
India: ***By Rail Across the Indian Subcontinent.*** By Paul Theroux. June, 696-743; ***India's Railway Lifeline.*** By Michael G. Satow. June, 744-749; Medicine and health: Rhinoceros products 410, 417; Sericulture 13, 14, 15, 18, 48; Silk, cultural use of 13; Silk industry 19, **32, 33**
Indian Mutiny (1857) 745
Indian Railways: ***By Rail Across the Indian Subcontinent.*** By Paul Theroux. June, 696-743
British origin 704
Coaches 704
Fares 728
Line inspector **722**
Locomotives, steam-powered 708
Narrow-gauge trains **698-699,** 728, 736 *see also* "toy train"
Overcrowding 718, 722
Passengers carried 701, 704
"People's Express" 712, **713,** 716
Porters licensed by 717
Profit 704
Second class 712, **713, 718;** Fare per mile, average 712
Sleeper **728**
Statistics 704
Ticketless travel 730, **731,** 734; Sign decrying **730**
Workers, number of 704
Indian reservations: Olympic Peninsula, Wash. 654
Indian Reserve of Gorotire, Brazil: ***Brazil's Kayapo Indians, Beset by a Golden Curse.*** By Vanessa Lea. May, 675-694
Indian rhinoceroses **413, 420-421;** Medicinal products 410, 417; Population 406, 413, 418, 420; Protection 413; Range 412-413; Relocation 420; Sacrificial rite 417-418; Size 413, 421
Indians Cursed by Gold (Kayapo). By Vanessa Lea. May, 675-694
Indians of North America: Alaska 53, 70, 71, 828; Calgary 390, **390,** 402-403; California 433-434, **457,** 461; Washington 654, 669, 672; *see also* Tlingit Indians
Indians of South America *see* Kayapo Indians
Indo-Pakistani war (1965) 708
Indonesia: Rhinoceroses *see* Javan rhinoceroses; Sumatran rhinoceroses
Indus River, India: Railroad crossing **744-745**
Industrial design: Italy 187, **198-199,** 206
Infrared lasers 335, 342, 343; Martian atmosphere 335
Inglefield Fjord, Greenland: ***Narwhal Hunters of Greenland.*** By Ivars Silis. Apr., 520-539
Inns: California 443; Hagi, Japan 755, 772; Port Townsend, Wash. **657**
Insect control: Ants used for 783, 813; Mantids used for **273**
Insects *see* Ants; Mantids; Silkworms
Inside Passage: ***Alaska's Southeast: A Place Apart.*** By Bill Richards. Jan., 50-87; ***An Incredible Feasting of Whales.*** By Al Giddings. 88-93
Integrated optoelectronic circuits (IOC) 363
Intercourse, Pa.: Aerial view **498;** Amish 498, 512; Antique shop **513;** Tourism 498, 512
International Express (train) 708
Inuit: ***Narwhal Hunters of Greenland.*** By Ivars Silis. Apr., 520-539
Inukitsoq (Greenland Inuit) 535, 538, 539
Iraan, Texas: Oil field 233
Iridectomy: Laser eye surgery 345
Irwin, Jerry, photographer: ***The Plain People of Pennsylvania.*** Apr., 492-519
Ischia (island), Italy 618, 625
Isotopes: Laser separation 357
Israel: Occupation of West Bank 242, 245, 261, 266, settlements 262, **264-265**
Italy:
The Dead Do Tell Tales at Vesuvius. By Rick Gore. May, 557-613
A Prayer for Pozzuoli. By Rick Gore. May, 615-625
Silk industry 36, 37, **42, 43,** 48
Surviving, Italian Style. By William S. Ellis. Feb., 185-209
Art treasures pollution-damaged 208
Capital *see* Rome
Earthquake (1980) 192-193
Economy 186, 188, 198-199, 201, 205, 206, 207; Dependence on imported fuel 198, 201, 205, 206; Family businesses 186, 187, **192,** 193; Shadow economy 186, 187, 192, 193, 205
Industries: Arms 186, 187; Automobile 186, 187, 198, 205, 206; Distribution map 187; Fashion **184,** 186, **186,** 187, 201, **201,** 205, leather-

working 187, **192,** 193; Film 207; Subway cars 186, 187; Tourism 185, 187, 201, 203, 208; Wine 186, 187, **190,** 207
Map 187
Politics: Disunity 185, 206; Frequent changes of government 185, 188, 206; Parties 188, **189,** 192, 205-206
Quality of craftsmanship and design 185, 186, 187, **198-199,** 201, 205, 206, 207-208
Ito Hirobumi 759, 772
Ivory carving: Yupik Eskimos 823, 826
Izu Oceanic Park, Japan: ***Japan's Izu Oceanic Park.*** By Eugenie Clark. Apr., 465-491

J

J. Paul Getty Museum, Malibu, Calif. **596-597**
Jackson, Nathan **71**
Jackson, Stonewall: Laser animation **337**
Jacquard mechanism: Silk looms 39, punch cards **32**
Jahangir (Mogul emperor): Tomb 708
Jains: Varanasi, India 721
Jama Masjid (mosque), Agra, India **703**
jambiyya (dagger) **410,** 412, 413, 422
James I, King (Great Britain) 12, 40
Jamrud Fort, Pakistan 705
Janata (People's) trains: India 712, **713,** 716-718
Japan: Fish farming 634, 640; ***Hagi: Where Japan's Revolution Began.*** By N. Taylor Gregg. June, 751-773; *Japan; Historical Japan.* June supplement; ***Japan's Izu Oceanic Park.*** By Eugenie Clark. Apr., 465-491; Krill harvesting **634-635,** 636, 640, 641; Sericulture 13, 15, 18-19, **27,** 30, 45, artificial diet 14, 18-19, **23;** Silk consumption 5, 15, 45; Silk industry 42, 45, 48; Timber imports 53, 64, 76; *see also* Japanese history
Japanese: Mantids: Medicinal use **280;** Symbolism 272, **280**
Japanese history:
Hagi: Where Japan's Revolution Began. By N. Taylor Gregg. June, 751-773
Christianity: Introduction of 756; Rejection of 756
Dutch colony 756, 765; Influence of 756
Emperor 752, 755, 761; Divestment of power 755-756, 765; Power restored 760; *see also* Meiji Restoration
Feudalism 755, 757, 760, 765; Abolishment of 772; *see also daimyos*
Government: Constitution (1868) 772; Dual system 755-756, 765; Shogunate *see* Tokugawa Shogunate
Legendary creation 755
Military take-over (12th century) 755-756 *see also* Shogunate
Modernization movement 751, 755, 756-759, 762-763, 772; Cultural preservation 755, 756, 762-763
Opening of Japan 772; Perry expeditions **750,** 751, 766-767, 772
Portuguese arrival 756
Rebellion (19th century) **752-754,** 758, 763, 771-772; Causes 752, 755, 767, 770, 771; Rifle units 771-772, source of weapons 772
Seclusion, era of 751, 756, 772; Foreign travel, penalty for 751, 755
Shogunate 756, 761 *see also* Tokugawa Shogunate
Warrior class (samurai): Rise of 755, 756; *see also* Samurai
Japan; Historical Japan. June supplement
Jashemski, Wilhelmina 594
Jasper: Roman jewelry **560, 561**
Javan rhinoceroses **413;** Extinction threatened 420; Medicinal products 417; Population 406, 413; Range 413
Jayakar, Pupul 19
Jazi, Awad 253
Jeep, Chinese-made 287, **290,** 293, 295
Jellyfish **476-477**
Jensen, Alf **669**
Jericho, Jordan 258, 261
Jessadapagorn, Napaporn 233
Jesus Jeans **186**
Jewelry: Chinese ethnic groups: Silver adornment **282, 283,** 313, 315, **321,** 323, **324-325, 328-329;** Herculaneum 557, **560-561, 563,** 570, **591,** 595, 598, cover
Jewish revolt (A.D. 66-70) 260
Jiangling, China: Chu tomb near 26
Jimmy, David 817
Jin Xuezhong 308, 315
Joffe, Peter 178
Jogger: LIDAR image of **356**
Johannesburg, South Africa: Rhino-horn trade **407, 410,** 411
John, Larry 817, 824
John, Mark 822-823
John, Paul 819, 822, 829, 834
John, Ralph **831**
John, Simeon 834
Johnson, Van 207
Jones, Arthur D. 545-546, 549
Jóo, Afpád **388,** 391, 394
Jordan: Kingdom in the Middle. By Thomas J. Abercrombie. Feb., 236-267
Bedouin **246-247,** 252, 253, 256, **257;** Settlement programs 256
Capital *see* Amman
Education 236, 248, 254, 261
Facts and figures 245
Farming 248, 249, 256, 258, 261; Crops 249, **251;** Irrigation projects 248, 249, 250
Fertilizer production 256
Flag **245**
History 242, 245, 254; Antiquities **236, 247, 249,** 249-250, 260, **261**
International investment 243, 248, 256
Labor force: Foreign employment 240, 243; Imported laborers **241,** 243; Women 254
Map 244-245
Occupied territory *see* West Bank
Population 245; Bedouin 256; East Bank 249; Students 248, 254; West Bank 257, 261
Royal family 242, 243, 245, 248, **252, 253,** 254
Seaport *see* Aqaba
Jordan Valley, Israel-Jordan **250-251;** Antiquities **249;** Development 248, 249; Farming 248, 249, **251;** Population 249
Jordan Valley Authority (JVA) 248, 249
Joshua: Traditional tomb 267
Juan Carlos, King (Spain): Democratic reforms 95
Juan de Fuca, Strait of 652, 659, 662, **666-667**
Judge Roy Bean Visitor Center, Langtry, Texas 232
Julius, Simeon **824**
Juneau, Joe 62
Juneau, Alaska **60, 62-63;** History 62-63; Population 63
Juruna, Mario 694
Just, Cassià 100, 105
Justinian (Byzantine emperor) 13, 30
Jute exports: Bangladesh 743

K

Kacha Garhi (refugee camp), Pakistan 705
Kaden, Hayden 75
Kaempfer, Engelbert 490
Kah Lituya (legendary creature) 87
Kalahari bushmen: Mantid lore 272
Kalka, India 711
Kamal Abdulfattah 258, 261
Kamrup Express (train) 728
Kanchenjunga (peak), India **734-735**
Kangaroos: Drought behavior 153, 173, **173**
Kangati (Kayapo Indian) **684, 685**
Kangding, China 291; Burial customs 291
Kangerlussuaq, Greenland *see* Inglefield Fjord
Kangle, China **303**
Kanhonk (Kayapo chief) 675, 680, 688, 694

kanoko (tie-dyeing process) 46; Knotting **46;** Patterns produced by **46, 47**
Kanpur, India: Railroad station **725**
Kappa Sport (fashion house): Jesus Jeans **186**
Kayaks: Capsizing of 531, 532; Construction 526, 527, **528, 529;** Narwhal hunting 520, **524,** 530, **532, 533, 534,** 535, 538, 539
Kayapo Indians: ***Brazil's Kayapo Indians, Beset by a Golden Curse.*** By Vanessa Lea. May, 675-694
Agriculture, slash-and-burn 693, 694
Birth control 691
Body decoration 684, 690; Application **684,** 690; Beads 694; Ceremonial **674, 676-677, 684, 685**
Chiefs 675, 680, **681, 686,** 687
Customs adopted 675, 687, 690
Diet 683, 690, 693
Festivals 677, 682, 686; Bemp 684, 686-687, ceremonies **684, 685,** preparations **688-689;** Dancers **676-677;** Food gathering for **678-679, 692-693**
Fighting ability 675, 676; Weapons 675
Fishing 683
Gold mining revenue 675, 682, 690
Headdresses **680, 681, 684, 685**
Lands 675, 678, 683, 694; Gold mining and prospecting 675, 682, **682,** 683, 688, 690; Intruders 675, 682, 683, 690, 693, 694
Manhood, symbols of: Modern 677, **693;** Traditional **674,** 676-677
Men's houses 675, 676, **679,** 686; Interior **684**
Population 675, 678
Religion, traditional 686; Evangelical replacement 683
Tape recorders **674,** 683; Uses 675, 677
Trade 687, 688
Villages 675, 678; Traditional layout 675, 676
Kazaks (people): Dress, traditional **298;** Massacre of (1939) 296; Population 296; Semi-nomads (Qinghai Province) **296-297;** Wedding **298-299;** Yurts **296, 297**
Keeler, R. Norris 349
Keiichi Hoshino 19, 26
Kelvin waves: El Niño currents and 163, 181, diagram **162-163**
Kenny, Rhian 391
Kenya: Rhinoceroses 406, 408, **414-415, 422,** map of range 412; Weaver ants 792-794
Ketchikan, Alaska 56, **79**
Khari, Hidaya 248
Khoury, Marwan 256
Khyber Mail (train) 707
Khyber Pass, Afghanistan-Pakistan: Railroad 696, 704, 705; Train **706**
Kikre Tum (village), Brazil 687
Kim, Helen **388**
Kimball, Elizabeth 275
Kimono, 18th-century **46;** Detail from **47**
King Faisal Street, Amman, Jordan 243
King Hussein Bridge, Jordan River 242, **243**
King salmon: Alaska **79**
Kipling, Rudyard: Quoted 711
Kiryat Arba (settlement), Jordan 262
Kiryu, Japan: Silk-weaving technology 48
Klahhane Ridge, Olympic Peninsula, Wash.: Mountain goat habitat 662-663
Klaserie reserve, South Africa: Drought die-offs 181
Klein, Ralph 382, 383, **384,** 386
Klondike gold fields, Yukon Territory, Canada: 1896-1898 gold rush 80-81, 84
Kluiters, Ignaat 125
Knight, John 175
Koetsier, Ed 395
Koji Nakamura 482
Krill:
Humpback whale feeding 88, 90, 93
Krill–Untapped Bounty From the Sea? By William M. Hamner. May, 626-643
Feed, processed animal 630, 633, **634,** 640
Fish types called "krill" 630, 632, 633, 634
Food resource, potential 630, 636, 642; Nutritive composition 636; Resource estimates 631, 632, 642
Habitats 632-633, 640
Harvesting **633, 634-635,** 636, 640-641; Excessive harvesting, possible repercussions of 631, 633, 641-642
Krill dishes **634;** Unappetizing 634, 640
Name: Origin of 630; Present-day meaning 630
Schooling behavior 633, 640
Whale food 627, 630, 631, 632-633, 636, 639
see also Euphausia superba, outlined
Kruger National Park, South Africa: Drought 181
Krypton laser **334**
Kuhn, Dwight, photographer: ***Mantids, the Praying Predators.*** Feb., 268-280
Kupreanof Island, Alaska **65**
Kuroshio (Black Stream) 59, 475; Map showing 474
Kyoto, Japan: History: Imperial court (pre-19th century) 755, Forbidden Gate, storming of (1864) **752;** Silk weavers 19, 26, **44**

L

LAGEOS (Laser Geodynamics Satellite): Plate tectonics measurements 343
LIDAR (light detection and ranging) 343, 356; Image from **356;** Transportable unit **356**
LIF (laser-induced fluorescence): Chemical detection 353, 355
Labor unions: Italy 185, 187, 193, 206
Laboratory for Laser Energetics, University of Rochester: Fusion reactor 357, 362, fuel pellets for **355,** 357
Labrang Lamasery, Gansu Province, China 303, **307;** Colleges 303, 308-309; Lamas 303, **309;** Pilgrims **307**
Lahore, Pakistan 707, 708; Brickworks 707; Train station 749
Lake Manyara National Park, Tanzania: Black rhino carcass **404-405**
Lamaism *see* Tibetan Buddhism
Lamar, Lawson **353**
Lamas: Labrang Lamasery, Gansu Province, China 303, **309;** Qinghai Hu island, China 301; "sky burial" services performed by 304-305
Lamaseries: Labrang, Gansu Province, China 303, **307,** lamas 303, **309;** Qinghai Hu island, China (former lamasery) 301
La Molina (ski resort), Spain 119
Lancaster County, Pa.: ***The Plain People of Pennsylvania.*** By Douglas Lee. Apr., 492-519
Landsat image: Jordan **244-245**
Landslides: California 430, 432; Ecuador 167
Langshan summer festival: Gansu Province, China **310-311**
Langtry, Lillie 232
Langtry, Texas 226, 227, 231, 232
Lapp, Ann **511**
Lapp, Geraldine, Lena, and Trina **514**
Lapp, Leon, and family **507**
Larsen, George 56
Larvae, silkworm **6-7,** 14, 15, **23, 25, 35**
Larval fish ("krill") 632, 633
La Sagrada Familia, Church of, Barcelona, Spain **104, 105;** Construction 105
Lasalle, Philippe de 39
Laser animation: Stone Mountain, Ga. **337**
Laser Ionics, Inc.: Laser fingerprint detection **353**
Laser Research Foundation, La.: Gynecological surgery 352-353
Lasers: ***Lasers–"A Splendid Light."*** By Allen A. Boraiko. Mar., 335-363; ***The Wonder of Holography.*** By H. John Caulfield. Mar., 364-377

Automotive industry 335, **348-349,** 355
Chemistry applications 336, 343, 348; Research 353, 355
Coherence 338, 341; Diagram **338**
Commercial applications: Product-code scanners 366, 374, **375,** diagram **374**
Computers, used in 336, 363
Criminology applications 335, **353**
Energy produced 335, 341, 342, 352, 355, 357
Energy sources 335, 336, 340, 341, 352
Fiber optics 336, **344,** 346, **347,** 363
Fusion reactors 336, **355,** 357, 362, 363
History 335
Holograms 335, 336 *see also* Holograms, *outlined*
Industrial applications 335, **339,** 342, **348-349,** 350, **350, 351,** 355, 357, 368, **368-369**
Infrared 335, 342, 343
Measurements by 342, 343, 348, 350, **350, 351,** 361, 368, **368-369**
Mechanics of 336, 340-341; Diagram **340-341**
Medical applications 336, **347,** 352-353; Cancer treatment 336, **344,** 345, 346, 353; Surgery 335, **344,** 345, **345,** 346, **347,** 352-353
Mediums 335, 336, **338,** 341, 342, 343, 348, 350, 352, 353, 355, 357, 362, 363, 368; Diagram **340-341**
Military applications 336, 349, 352, **358-359,** 361, 362, 363; Antimissile defense 352, 362, 363; Antisatellite weapons **360-361,** 362; Communications with submarines 348-349, diagram **357**
Mirrors, use of 336, 340; Diagram **340-341**
Name meaning 336, 338
Natural 335, 336
Optical **334,** 335, **337,** 338, **339,** 343, 348-349, **348-351,** 352, 357, 363
Physics of 335, 336, 340-341; Diagram **340-341**
Research applications 336, 342-343, **347, 348,** 352, 353, 355, 361, 363
Spectrum 335, 338, 341, 343 *see also* Infrared; Optical, *above;* Ultraviolet; X-ray, *below*
Tunable 338, 341, 343, 348
Ultraviolet 335, 338, 348
X-ray 338, 349, 352; Antimissile defenses 352, 363
La Solfatara (volcano), Italy **619**
"Last Supper" (Leonardo da Vinci): Color print by NGS **555;** Restoration 199
Laurentian Library, Florence, Italy 576
Lawrence of Arabia 256; Quoted 239
Lawrence Livermore National Laboratory, Calif.: Laser-powered fusion reactor **354**
Lea, Vanessa: ***Brazil's Kayapo Indians, Beset by a Golden Curse.*** May, 675-694
Lead poisoning: Romans 600, 606
Leaf-cutting ants: Fungus gardens **796,** 800; Mandibles **794;** Nests, size of 796, 800; Workers **794, 795, 796,** 800
Leaf-like mantids 273, **277, 278, 279,** 280
Leather goods: Italy 186, **192,** 193
Lee, Douglas: ***The Plain People of Pennsylvania.*** Apr., 492-519
Lee, Robert E.: Laser animation **337**
Leith, Emmett 366
Leks: Harvester ants 800
Lenie, Pieter 631, 636, 641
Leonardo da Vinci 36, 199, 555
Lesh, Jack and Sally 80
L'Esperance, Francis: Laser surgery techniques 345
Lett, Ken 397
Lettuce harvest: Salinas Valley, Calif. **436,** 456
Levinger, Miriam 262, 266
Levinger, Moshe 262
Lewis, Ian: Quoted 129
Lewis, Michael 176
Lhasa, Tibet 293-295; Accommodations, cost of 294
Lhasa-Golmud road, China **294-295,** 295, 300, 301
Li Yandai 301
Liao Ruqi 317, 320
Library, private lending: Redford, Texas 225
Light Rail Transit (LRT): Calgary, Alberta, Canada 386
Light technology: ***Lasers–"A Splendid Light."*** By Allen A. Boraiko. Mar., 335-363
Lilaeopsis (plant) **134-135**
Limestone formations *see* Sinkholes
Limpopo River, Africa: Drought 176
Lincoln, Joe 816-817
Lincoln Laboratory, Massachusetts Institute of Technology: Transportable LIDAR **356**
Lindseth, Roy 400
Lip disks: Kayapo Indians 676, 677
Little Light, John **390**
Little Port Walter, Alaska: Annual rainfall 70
Lituya Bay, Alaska: Seismic upheaval (1958) 83, water surge 83, 86, 87; Tlingit lore 87
Liverman, Marc 656
Living Buddhas **306,** 311
Llach, Lluis 120
Lloret de Mar, Spain **96-97**
Lobster krill 632
Lockwood, Mariii **657**
Log patrollers: Washington 662
Loggers: Olympic Peninsula, Wash. 652, **653,** 666-667, 668, contest event **658-659**
Logging: Southeast Alaska 64, 65, **76-77,** habitat destruction and 64, 65, 67, 77; Washington camp 668
Lompoc Valley, Calif.: Flower fields **426-427**
Long March: Chinese Red Army 284-285, 304
The Long Valley (Steinbeck) 453
Longboats: Narwhal hunters 535, 538, 539
Longe, China: Dong festivals 328
Looms 19, **31,** 36, **44;** Computer-driven 48; Jacquard mechanism 39, cards **32**
Lopez, Francisco: Poultry farm 160, 167
Lopez, Roberto 160
Lord of the Shallows–The Great Blue Heron. By Richard J. Dolesh. Apr., 540-554
Los Angeles, Calif.: Tornado wreckage **157**
Los Padres National Forest, Calif. 432, 450
Los Rancheros Visitadores (trail-riding association): Spring outing 434-435, 438, **448-449**
Louchard, Ed 659
Lougheed, Peter 400-401
Louis XI, King (France) 37
Louis XIV, King (France): Bedchamber furnishings, restored 40, **41**
Lumbering: Laser-assisted saws **350;** Southeast Alaska 64, 65, **76-77;** Washington **350,** 652, 653, 662, 667, 668, 669
Luo Jungui **304**
Luongo, Giuseppe 624
Luo Wengui 287, **290,** 300, 308
Lynn Canal (fjord), Southeast Alaska: Salmon gillnetting 56, 61
Lyon, France: Silk industry 10, 12, 37, 39-40

M

M-1 tanks: Laser ranging **358-359**
MX missile: Planned test site 430, protest against **455**
Maaleh Adumim (settlement), Jordan **264-265**
McAdoo, Jewel: Quoted 215
McCarty, Robin **663**
McClure, Barney 655
McCormick, John **133**
McCrory, Robert, Jr. 357, 362
McCullough, Gary 56, 61
McCurry, Steve, photographer: ***By Rail Across the Indian Subcontinent.*** June, 696-743
McDonald's (restaurant): First Egg McMuffin served 443
Macedon, Australia: Bushfire 171, 174, 176; Ruins **177**
Macleod, James 379, 397, 402
McMillin, Dave 653, 655
Madden, Roland 182-183

Madonna Inn, San Luis Obispo, Calif. 443
Madras-Janata Express (train) 716-718
Madras Railway 745
Madrid, Enrique 225
Madrid, Lucy Rede **219**
Maebara Issei 772
Maggi, Giuseppe 570, **571,** 600, 611
Mahendra, King (Nepal): Memorial sacrifice for 418
Mahoney, John: Quoted 220
Mahood, Harriet, Kathleen, and Sam **393**
Maiman, Theodore H. 335
Makah Indians **663,** 669, 672; Fishermen's association 672; Whale hunting 672
"The Making of America" map series: *Alaska,* Jan. supplement; *Far West,* Apr. supplement
Malibu, Calif.: Art museum **596-597**
Mallott, Byron 71, **73**
Malone, George **439**
Maltese, Vincenzo 625
Mantids, the Praying Predators. By Edward S. Ross. Feb., 268-280
Camouflage **268-269,** 273, 274, 275, **278-279**
Cannibalism 273, **275,** 276
Diet **270,** 271, 273, 274, 280
Evolution 271, 273
Eyespots 272, **277,** 280
Ferocity 268, 275
Forelegs **270,** 271; Spines **271**
Lore 268, 272-273
Medicinal uses 273, **280**
Name origin 268
Pest control 273, **273**
Reproduction: Egg cases **276, 277;** Hatching **276,** 280; Mating **274-275,** 276
Species 271, 273, 278
Vision 271; Eyes **270**
Mantises *see* Mantids
Manyfingers, Norman 390
Map supplements: *Alaska,* The Making of America series. Jan. supplement; *Far West,* The Making of America series. Apr. supplement; *Japan; Historical Japan.* June supplement
Maps:
Africa: Rhinoceros range 412
Alaska: *Alaska,* The Making of America series. Jan. supplement; Southeast Alaska 56-57
Alberta (province), Canada 383
Asia: Rhinoceros range 412-413; Silk Road 12-13
Australia, locating sinkholes 132
Bangladesh: Rail system 747
Bering Sea, and region 817
Brazil: Indian Reserve of Gorotire 678
California: Mid-coast region 432-433
Catalonia (autonomous region), Spain 101
China: Central China 286-287
Chesapeake Bay, and region, Md.–Va.: Heronries 545
Greenland: Inglefield Fjord 526
Hagi, Japan, showing historical sites 757
India (subcontinent): Rail lines 696, 704, 710, 712, 716, 724, 729, 741, 746-747
Inglefield Fjord, Greenland 526
Italy 187; Bay of Naples region 574-575; Pozzuoli, Gulf of, and region 620
Japan: Hagi, showing historic sites 757; Izu Oceanic Park, located 474; *Japan; Historical Japan.* June supplement
Jordan 244-245
Lancaster County, Pa. 498-499
Olympic Peninsula, Wash. 654
Pakistan: Rail system 746
Pennsylvania: Lancaster County 498-499
Puget Sound region, Wash.: Precipitation 654
Spain: Catalonia (autonomous region) 101
Texas: Trans-Pecos region 226-227
West, U. S.: *Far West,* The Making of America series. Apr. supplement
World: El Niño current's global impact (1982-1983) 154-155
Marfa, Texas **228,** 229, 233
Margerie Glacier, Alaska **53-55**
Maria Bonita (gold mining site), Brazil 690
Marine biology: ***Japan's Izu Oceanic Park.*** By Eugenie Clark. Apr. 465-491; ***Krill–Untapped Bounty From the Sea?*** By William M. Hamner. May, 626-643
Marine Living Resources Convention (1982) 642
Markam, China: Horse race near 316, 319
Market, Roman (ruins): Pozzuoli, Italy **616-617,** 618
Markishtum, Hubert 669, 672
Markishtum, Jackie 669
Marmots, Olympic **648**
Marriage customs: Ge people 326; Miao people 326-327; Qiang people 306-307; Tu people 300, 301, 303
Mars (planet): Natural laser 335, 336
Martin, Esmond Bradley: ***They're Killing Off the Rhino.*** Mar., 404-422
Maryland *see* Black Swamp Creek
Masers 338
Mass, outdoor: Pozzuoli, Italy **614-615**
Matheran Railway, India 749
Matthews, Ken 171
May Day parade: Bologna, Italy **189**
Maze, Stephanie, photographer: ***Catalonia: Spain's Country Within a Country.*** Jan., 95-127
Mazzatenta, O. Louis, photographer: ***The Dead Do Tell Tales at Vesuvius.*** May, 557-613; ***A Prayer for Pozzuoli.*** May, 615-625
Medicine and health: Frass 15; Laser applications 336, **347,** 352-353, cancer treatment 336, **344,** 345, 346, 353, surgery 335, **344,** 345, **345,** 346, **347,** 352-353; Mountain sickness 295, 300; Rhinoceros products **407, 410,** 411, 417; Silk, uses for 13, 14, vascular prostheses 13, **37,** 43, 45; *see also* Folk medicine
Medicine shops: South Africa **407,** 411
Medusa (jellyfish) **476-477**
Meiji, Emperor (Japan) 755, 763, 772
Meiji Restoration (1868) 755, 760, 763, 769, 771, 772; Revolt against 769, 772
Melbourne, Australia: Bushfires near 171, **176-177;** Dust storm **150-151,** 171
Mennonites: ***The Plain People of Pennsylvania.*** By Douglas Lee. Apr., 492-519
Beliefs 498
Children: Domestic chores 506, **506**
Church divisions 498, 500, 501
Communities (Lancaster County) 498
Farm mechanization, limited 505
Farms **506-507;** Livestock farming 506
Home shops **512**
Meetinghouse **500-501**
Modern conveniences rejected 493, 501, 505, 512
Origins 498
Transportation, nonmotorized **500, 501,** 512, **518-519**
Youth: Provision for 506, 518-519; Social life 518-519; Work 506, **512, 515,** "hired boys" 506
Men's houses: Kayapo Indians 675, 676, **679,** 686, interior **684**
Meru National Park, Kenya: White rhinoceroses **414-415**
Messick, Harry Gray 554
Meteorology: ***El Niño's Ill Wind.*** By Thomas Y. Canby. Feb., 144-183
Mexican Americans: Trans-Pecos, Texas 226, 227, 233-234
Mexican migrant workers: Salinas Valley, Calif. **436-437,** 456
Miao (people): ***Peoples of China's Far Provinces.*** By Wong How-Man. Mar., 283-333
Beliefs: Spirits and demons 323, 326
Dress, traditional 312
Indochinese Miao 288, 308
Legend 320
Marriage customs 326-327
Music 323
Population 288, 308
Silver adornment, importance of 283, 315
Subgroups 288, 308, 312; *see also* Flowery Miao; Hei Miao; *and* Ge

Superstitions: Premarital ritual 326
Written language, absence of 320, 321
Michalkow, Donald **401**
Microwaves: Masers 338
Middle East *see* Jordan
Migrant farm laborers: Salinas Valley, Calif. **436-437,** 456
Milan, Italy 198-200; Fashion industry 186, 201, 205
Miller, Clay and Jody: Cattle ranch 227
Miners, Ashley **172**
Miners, Snowy **172-173**
Min Jiang (river), China **314;** Bridges 305
Min Shan (mountain range), China **284-285,** 304, 305
Mirabile, Lorenzo 619, 623
Mirrors: Laser components 336, 340, diagram **340-341;** Solar reflector **302**
Missiles: Laser defenses against 336, 361, 362-363; Testing of 430, protest against **455**
Missionaries: 16th-century Japan 756, expulsion of (17th century) 756
Missions: California 434, **434, 435,** 442
Misty Fjords National Monument, Alaska **67;** Molybdenum deposit 82, mine development 82-83
Model, fashion **38**
Moi, Daniel Arap 422
Molybdenum deposit: Alaska 82, development of 82-83
Monash University, Victoria, Australia: Sinkhole studies **138, 140-141**
Monasteries: China **20-21** *see also* Labrang Lamasery; India 48; Spain 100, 105, **110-111**
Money, U. S.: Hologram use proposed 367, 375
Mongols: Invasion of China 290
Monkey: Ayodhya, India, train station **727**
Monsoons 705, 708; Bangladesh 730, flooding 730, **738-739, 740-741**
Montana, Montie 435
Monte Nuovo (volcano), Italy 619, 623
Montecito, Calif. 443
Monterey, Calif. 430, 443, 456, 458, 461; Cannery Row 456
Monterey County Fair: Diaper Derby **442**
Montserrat (mountain), Spain 100, **110-111;** Monastery 100, 105, **111,** library **110,** publishing 100, 110; Visitors 110
Moore, Bill 229
Moore, Cora 224
Moore, Dede **657**
Moore, Gloria 229
Moore, Jaroy 233
Moore, John 224
Moore, Wilma 823
Moore, Yvonne 668
Moorhead, Bruce 662-663
Morandini, Antonietta 576
Moray eels **465-467, 486-487**
Morgan, Darlene **819**
Mori family (Japanese *daimyos*) 755, 757, 760, 765, 767, 768; Castle 760, 768-769, 772; Cemetery **770-771**
Moriguchi, Kakoh 13
Morwong **486**
Mosaic Atrium, House of the, Herculaneum, Italy **565,** 569, **579, 592-593**
Mosques: India **703,** 718; Jordan 266, **266-267**
Moths: Gypsy moths 42; Silkworm moths **13,** 14-15, **26,** 27, egg laying 15, **26, 27,** life span 15, 26
Moti Masjid (Pearl Mosque), Agra, India 718
Motor trips: ***Peoples of China's Far Provinces.*** By Wong How-Man. Mar., 283-333
Motorcycle: Beauty salon **401**
Mount Gambier, South Australia: Map locating 132; Sinkholes near 132, 133, 137
Mount Royal College, Calgary, Alberta, Canada **388,** 391
Mountain goats: Olympic Peninsula, Wash. 662-663
Mountain sickness 295, 300
Movie industry *see* Film industry
Mpeo (people): Dress, traditional 313; Silver adornment 313, 315
Mudslides: California **156;** Ecuador victims **166**
Muga caterpillar: Silk, quality of 14
Muhaisin, Muzahim 256-257
Muir, John: Quoted 75
Muktuk 526, 527, 534, 535, 537, **538,** 539
Mulam (people): Han assimilation of 333
Mu Lan **16-17,** 26
Mulberry silkworm *see Bombyx mori*
Mulberry-tree farming: Chinese commune **22-23;** Horticultural swindle (1835) 42; Leaf-plucking methods 19
Mule-drawn cultivator **504-505**
Muller's Mortuary, Salinas Valley, Calif. 456
Munda (tribe): Wild silkworms 18
Murals: Pompeii, Italy **557,** 586, 594
Murchison Falls National Park, Uganda: White rhinoceroses 408
Murray, Karen **401**
Museum of Indian Railways, New Delhi 749
Museums: Figueras, Spain **107;** Hagi, Japan **756,** 760; Malibu, Calif. **596-597;** Naples, Italy 611, 613
Musical instruments: Italy 187; School for violin makers 207-208
Musicians: Calgary, Alberta, Canada **388,** 391, 394
Musk-ox hunting: Alaska 834
Muslim, Mohammed 257
Muslims, Chinese 301 *see also* Hui; Kazaks; Salars
Mussolini, Benito 205, 207
muti shops: South Africa **407,** 411
Mutsuhito, Emperor (Japan) *see* Meiji, Emperor
Mysid shrimp ("krill") 632, 633

N

Nabataeans (people) 246, 250; Capital *see* Petra, Jordan
Nablus, Jordan 266; Israeli soldiers **263**
Nablus Road 258
Naidoo, K. M. 411
Namias, Jerome 183
Namibia: Drought **179;** Rhinoceroses 413
Nanjemoy Creek, Md.: Heronry 545, 546, 554
Naples, Italy 186, 191; Cathedral 617, 618, **618;** Earthquake (1980) 572, 574; Leather goods manufacture **192,** 193; Organized crime 185, 191; Patron saint *see* Gennaro, San; Smuggling **196, 197;** Spanish Quarter **194-195**
Naples, Bay of, and region: Earthquakes 192-193, 572, 574, 584, 587; Map 574-575; Soil fertility 574, 587; *see also* Pozzuoli, Gulf of
Napoleon I: Silk orders placed by **10,** 40
Naramoto Tatsuya 767
Narwhal Hunters of Greenland. By Ivars Silis. Apr., 520-539
Dangers 531, **532-533,** 535
Distribution of catch 534, 537, **538,** 539
Economic importance 525, 527, 534
Floating of catch 530, 531, **534,** 539; Hunting bladders 530, 531, **532,** 539
Harpoons **529,** 530, **533,** 538, 539
Kayaks 520, **524, 529,** 530, **532, 533, 534,** 535, 538, 539
Kill, annual 532, 539
Storage of meat 534, 538, 539
Narwhals: ***Narwhal Hunters of Greenland.*** By Ivars Silis. Apr., 520-539
Enemies 535
Muktuk 526, 527, 534, 535, 537, **538,** 539
Predation 520, 523
Shyness 530, 535
Speed 535, 538
Tusks 520, 523, 525, 527, 530, **536-537**
"unicorn" nicknames 520, 536
Weight 523, 527
Naser, Muhammed 266
Nasiffik (cliff), Qeqertat, Greenland **530,** 534-535
Nasir Bagh (refugee camp), Pakistan 705
Nasir family: Birzeit University 261
Nasturtiums **58**
Natal (province), South Africa:

Drought **182-183;** Rhinoceroses 407, 411, 414
Natal Parks Board: Confiscated rhino horns **409**
National Archaeological Museum, Naples, Italy 611, 613; Art treasures **557, 590, 598-599, 607, 610**
National Audubon Society 540; Bald eagle study 69
National Gallery of Art, Washington, D. C.: "Last Supper" photomural **555**
NATIONAL GEOGRAPHIC: Hologram cover (March) 372; Indexes: *Cumulative Index, Volume II* (1947-1983) 423, Six-Month Index 423; Printing and production 281, laser use 335
National Geographic Society: First scientific expedition 60; Grants: Ain Ghazal excavation 261, Christmas Island bird study 170, Herculaneum excavation 570, 571, weaver ant study 792
National Guardsmen: Alaska **831**
National historic districts: Port Townsend, Wash. 656
National Indian Foundation (FUNAI): Brazil 682, 683, air service 686, 687, building projects **680,** 687
National parks: Botswana 178, 181; Japan: ***Japan's Izu Oceanic Park.*** By Eugenie Clark. Apr., 465-491; United States *see* Olympic National Park, Wash.
National Research Council, Canada: Laser use in art restoration **342**
National Science Foundation: Study grants: Krill study 630; Research station *see* Palmer Station, Anvers Island, Antarctica
Native American corporations: Alaska 53, 60; *see also* Calista; Sealaska
Native American monitors: California archaeological sites 433, **457,** 461
Natural gas fields: Alberta (province), Canada 382, 400, map 383
Nature Conservancy: Purchase of heronry 554
Neah Bay, Wash. 663, 669, 672
Neckties, silk: Manufacture **43,** 48
Needlework: Ge people **282,** 315, **324-325;** Hei Miao people **289,** 313; Silk embroidery **2-3, 11, 16-17, 18**
Nelson Island, Alaska: ***Eskimo Hunters of the Bering Sea.*** By Brad Reynolds. June, 814-834
Nelson Island High School, Alaska 823
Nepal: Rhinoceroses 406, 418, **420-421,** map 412-413, sacrificial rite 417-418
Nerrivik (Eskimo goddess) 538
Nevada: *Far West,* The Making of America map series. Apr. supplement
Nevak, Eva 823
Nevak, Fritzie **827**
Nevak, George 826
New Delhi, India: Train stations **717, 718, 719**
Newport Corporation, Fountain Valley, Calif.: Holographic interferometer, portable 368, **368-369**
Newspapers: Laser applications 335
Ngorongoro Crater, Tanzania: Wildlife **418**
Nicholls, Neville 181
Nickle, Carl O. 394
Nicklin, Flip, photographer: ***Krill–Untapped Bounty From the Sea?*** May, 626-643
Nicolosi, Italy 196
Nigeria: Silkworm workers 18
Nightmute (village), Alaska 816, 824; Map 817
Nilson, Russell 88
Ningam, Ollie Frances 724-725
Nishijin, Kyoto, Japan: Weaving, silk 19, 26
Nitidulid beetles: Ants and **808-809**
Nomads and semi-nomads: Kazaks **296, 297;** Tibetans 291, 311, **318-319,** yak herders 293; *see also* Bedouin
Noor, Queen (Jordan) **253**
North Yemen: Rhino-horn daggers **410,** 412, 413, 422
North-West Mounted Police: Canada 378-379, 383
Northwest School of Wooden Boatbuilding, Port Townsend, Wash. 659, **660, 661**
Nothomyrmecia macrops (primitive ant) **778,** 779, 785, 786
NOVA (energy conglomerate): Calgary, Alberta, Canada 395
Novette (laser) 352, 362
Nuapatna, India: Thigh-reeling (silk spinning) 19, **33**
Nuclear arms protest: Bangor, Wash., submarine base 666
Nuclear power plant: Diablo Canyon, Calif. 430, 432, **455**
nuées ardentes (volcanic phenomena) *see* Glowing avalanches
Nunakauiak Yupik (corporation) 829
Nunam Kitlutsist (Protectors of the Land) 829
Nunivak (island), Alaska 829, 834
Nylon: Introduction of 43

O

Obi patterns 26, **45**
O'Brien, Peter 152, 153
Ocean currents: Japanese waters 465, Kuroshio 59, 475; *see also* El Niño current
Oceanic park *see* Izu Oceanic Park, Japan
Of Mice and Men (Steinbeck) 456
Ohara, Japan: Craftswomen **46**
Ohio, U.S.S. (nuclear submarine) **666-667**
Oil exploration: Bering Sea, and region 828, 829; Catalonia 125
Oil industry: ***Calgary: Canada's Not-So-Wild West.*** By David S. Boyer. Mar., 378-403; California: Offshore wells 425, 430, 439, 449; Spain: Offshore wells 124-125; Texas 233
Old Order Amish (sect): ***The Plain People of Pennsylvania.*** By Douglas Lee. Apr., 492-519
Old Order Mennonites (sect): ***The Plain People of Pennsylvania.*** By Douglas Lee. Apr., 492-519
O'Leary, Dan **37**
Olivetti company: Sales 206; Typewriter design **198,** 206
Olympia oysters (Olys) 652, 653, 655
Olympic Loop Highway (U. S. Route 101), Olympic Peninsula, Wash. 652, **671**
Olympic marmots **648**
Olympic Mountains, Wash. **650-651,** 654; Mountain goats 662-663
Olympic National Park, Wash.: Area 652; Creation 654, 662; Hiking trails 654; Land acquisition: Coastal section **644-645,** 654, opposition to 662, 666-667, 669; Wildlife **648,** 662-663, 669, **673;** Wildlife management 662-663
The Olympic Peninsula. By Bill Richards. May, 644-673
Air quality 663, 666
Area 652, 654
Climatic contrasts 654, 663
Employment 662, 666, 667; Seasonal employment 652-653; *see also* Fishing industry; Lumber industry, *below*
Fishing industry 653, 665, 668-669, 672
Forests, depletion of 653, **670**
Geology 662
Glaciers **650-651,** 652
Lore 652, 662
Lumber industry 652, 653, 662; Loggers **653, 658,** 668; Logging operations 668, **670-671;** Timber exports 670
Maps 654
Rain forest **646-647,** 654
Tourism 652, 655, 656, 663, 667, 672
Vegetation **646-649,** 652, 653, 662, 663
Water quality 653, 665, 668-669
Wildlife **648,** 662-663, **664-665, 673;** Absent species 662, 672
Olympic Saddledome, Calgary, Alberta, Canada **387,** 395, 400
Olympic Village, Calgary, Alberta, Canada 400
Olympus, Mount, Wash. **650**
Omega (laser) 357, 362
O'Neil, Joseph 662
Ootacamund, India: Rail line 749
Optical fibers: Laser-beam transmission 336, **344,** 346, **347,** 363, 366

Optics *see* Holograms; Lasers
Optoelectronics 336, 363
Orange County, Fla.: Sheriff **353**
Orange starfish **470, 484**
Orchid, pink **268-269;** Praying mantis camouflage **268-269**
O'Rear, Charles, photographer: ***Lasers–"A Splendid Light."*** Mar., 335-363; ***The Wonder of Holography.*** Mar., 364-377
Organized crime: Italy 185, 191; Public protest against 191
Oriols, Sofia **121**
Owens, Jim and Rosie 458, 461
Oxpeckers 408, **417**
Oysters: Olympia 652, 653, 655; Pacific 653
Ozette (archaeological site), Wash.: Excavation of 672

P

Pacific coast, U. S.: ***East of Eden: California's Mid-coast.*** By Harvey Arden. Apr., 424-461; ***The Olympic Peninsula.*** By Bill Richards. May, 644-673; *see also* Southeast Alaska
Pacific Gas & Electric: Nuclear power plant: Diablo Canyon, Calif. 430, 432, **455**
Pacific Ocean: Coral-reef deaths 155, 168, 171; Rise in sea level (1982-1983) 154, 181
Pacific oyster 653
Pacifica, Calif.: Storm **158-159**
Pack Creek, Alaska: Brown bears 80
Paine Field, Everett, Wash.: Head-up display landing **377**
Pakistan: ***By Rail Across the Indian Subcontinent.*** By Paul Theroux. June, 696-743; Rail system (map) 746
Palace on Wheels (train): Dining car **714-715**
Palafrugell, Spain: Aerial view **118-119;** Veterans **114-115**
Palazzo Durini, Milan, Italy 200-201
Palermini, Piero 207
Palestine (British mandate) 242, 245, 262
Palestinians: Jordan 242, 258, 261, **263,** refugees 245, 248, 254, **262-263**
Palmer, Nathaniel 632
Palmer Station, Anvers Island, Antarctica: ***Krill–Untapped Bounty From the Sea?*** By William M. Hamner. May, 626-643
Panama: Army ants 801; Coral reefs **168-169**
Paolucci, Antonio 208
Paper manufacturing: Olympic Peninsula, Wash. 653, 670
Papyri, Villa of the, Herculaneum, Italy 595, **596;** Replica **596-597;** Scrolls 595, 596, **600-601;** Sculpture 595, **598-599**
Parasites: Amazon ants **806-807,** 811; Beetles 809, **810,** 811; Wasps 280
Parfet, Claude and Courtland **422**
Paris, France: Haute couture 14, **38**
Parker, Ian 421
Parmesan cheese **191**
Parrot feathers: Kayapo Indian adornment **680, 681, 684, 689**
Passementerie decoration: Velvet clock **40**
Passports 143
Pasteur, Louis: Silkworm-disease discoveries 39
Pastorino, Carlos 170
Patan, India: Patola weaving 19, **30**
Paterson, N.J.: Silk manufacturing 42
Pathan tribesmen 707; Railroad worker **707**
Patola weaving: Patan, India 19, **30**
Patuxent River, Md.: Great blue herons 541, 545, 549, **552-553,** 553
Pavarotti, Luciano 207
Pearl Mosque, Agra, India 718
Pearson, Pauline 456
Pebble Beach, Calif. 443
Peck, Ted 229
Peck (food store), Milan, Italy 200
Pecos, Texas 224, 233; Rodeo, first 220
Pecos River, Texas 224, 231, 233
Pedicabs: Bangladesh **740-741**
Peed, Betty and Donald 545
Peffer, Randall: ***Catalonia: Spain's Country Within a Country.*** Jan., 95-127
Pegau, Bob 834
Pegues, Gwen **81**
Pegues, Robert 61, 81
Pelican, Alaska 56
Penguins: Krill feeders **638-639**
Penitents: Tarragona, Spain **112**
Pennsylvania: ***The Plain People of Pennsylvania.*** By Douglas Lee. Apr., 492-519
Peoples of China's Far Provinces. By Wong How-Man. Mar., 283-333
Pequea Amish Mennonite Church, Pequea, Pa.: Quilting **502-503;** Softball game **502-503**
Perry, Matthew C.: Japanese expeditions **750,** 751, 765-767, 772
Peru: Fishing industry 167, 170; Storms 167, 170
Peru Current: Food chain **164,** 167, 170
Peshawar Cantonment station, Peshawar, Pakistan 705, **709;** Superintendent **708**
Pessarrodona, Marta: Quoted 127
Pest control: Ants 783, 813; Mantids 273, **273**
Petersburg, Alaska **59;** Residents 56, **58**
Peterson, Helen 672
Petra, Jordan **236, 247,** 250, 252; Bedouin cave **246-247**
Petro-Canada (federal energy corporation) 395, 403; Skyscrapers **386,** 395
Pfeiffer Beach, Calif. **428-429**
Pharaoh's Treasury, Petra, Jordan **236, 247,** 250
Pheromones: ***The Ant and Her World.*** By Caryl P. Haskins. June, 774-777; ***Ways of the Ant.*** By Bert Hölldobler. June, 779-813
Philander, S.G.H. 182
Philip V, King (Spain) 95; Defeat of Catalans 113
Philodemus (Epicurean philosopher) 601
Phlegraean Fields Caldera, Italy 617, 624; Map 574; Volcanoes 619, **619,** 623
Phorid flies: Ant pests **795**
Phosphate production: Jordan 256
Photochemistry: Lasers used in research 353
Photons: Role in lasers 336, 338, 340, diagram **340-341**
Photoradiation: Cancer treatment **344,** 345, 353
Photosynthesis 138, **139**
Physics: ***Lasers–"A Splendid Light."*** By Allen A. Boraiko. Mar., 335-363
Phytoplankton 138; Diatoms **626-627,** 633, **642**
Piano di Sorrento, Italy **584**
Pienaar, U. deV. 181
Pilaloa, Luis Aldoz 167
Pilgrims: Labrang Lamasery, Gansu Province, China **307**
Pinchevsky, Jaime 160
The Pines (freshwater sinkhole), South Australia **132-133,** 133
Pingzhai Commune, Guizhou Province, China: Reception ceremonies 323
Pink salmon: Alaska 64, 79
Pismo Beach, Calif. 430, 442, 443, 461
Pismo Dunes State Vehicular Recreation Area, Calif. **456-457**
Pitts Special biplanes: Royal Jordanian Falcons **239**
Piura, Peru 167
Pizzagalli, Ornella **42**
Place, Mara **64**
A Place Apart: Southeast Alaska. By Bill Richards. Jan., 50-87
The Plain People of Pennsylvania. By Douglas Lee. Apr., 492-519
Planked salmon **665**
Plankton: Glacial runoff 520-523; Halibut feeding 520, 523; ***Krill–Untapped Bounty from the Sea?*** By William M. Hamner. May, 626-643
Planting of the Arrow (Tibetan ritual) **312-313**
Plants: Diatoms **626-627,** 633, **642;** ***Exploring a Sunken Realm in Australia.*** By Hillary Hauser. Jan., 129-142
Plaster casts: Vesuvius victims 591
Plate tectonics: African plate 572, 574; California faults 449-450, **454,** 455; Laser-satellite measurements 342-343, 361; Olympic Peninsula, Wash. 662

Plaza Molina, Barcelona, Spain 105
Pliny the Elder 13; Death 574, 576, 584; Vesuvius eruption, observation of 572, 574, 576, 588, 591
Pliny the Younger 574, 577, 610; Vesuvius letters 576, 584
Plototoxin (catfish venom) 473
Plus-15s (elevated walkways): Calgary, Alberta, Canada **381, 385,** 386, 390
Plutonium: Purification by lasers 357
Po Valley, Italy 201, 207
Poaching: ***They're Killing Off the Rhino.*** By Esmond Bradley Martin. Mar., 404-422
Podagrion (parasitic wasps) 280
Poetry, Japanese 760, 771, 772; Haiku 767, 772
Point Baker, Alaska 56
Point Reyes Bird Observatory, Calif.: Seabird mortality 154
Poisonous fishes: Catfish **472-473;** Scorpion fish **483**
Polar Eskimos: ***Narwhal Hunters of Greenland.*** By Ivars Silis. Apr., 520-539
Police: Laser applications: Fingerprint detection 335, **353**
Pollutants: Laser detection 356
Polynesia: Storms **144-145,** 155, 170
Polyps: Close-up **478-479**
Poly-Royal celebration: Architectural design competition **440-441**
Pompeii (ancient city), Italy: ***The Dead Do Tell Tales at Vesuvius.*** By Rick Gore. May, 557-613
Aerial view **608-609**
Art **557,** 586, **590,** 594, **607, 610-611**
Destruction of 557, 566, 569, 575, 588, 591, 607; Timetable of events 577
Earthquake damage (1980) 584; Remedial measures taken 584, **611**
Tourists 584, 586
Ponte, Rio da (river), Brazil: Pollution 683
Poochera, Australia: Ants, primitive 785
Porcupine fish **480-481**
Porlezza, Giampaolo 37
Port Julius (ruins), Gulf of Pozzuoli, Italy 619, **621**
Port Townsend, Wash. 655, **656-657;** Boatbuilding school 659, **660, 661;** Boomtown (19th century) 655, 656; Tourism 655, 656
Portia (skeletal remains): Herculaneum, Italy 581, 594-595, 600, 606
Portolá, Gaspar de 120, 434
Portuguese: Japan, arrival in (1543) 756
Potash extraction: Jordan 256
Potter, Phil 133
Povah, Trev 438
Pozzuoli, Italy 572, 574; ***A Prayer for Pozzuoli.*** By Rick Gore. May, 615-625
Pozzuoli, Gulf of: Fumaroles **620,** 623; Map 620; Roman ruins 619, **621;** Statue raised from **622-623**
A Prayer for Pozzuoli. By Rick Gore. May, 615-625
The Praying Predators (mantids). By Edward S. Ross. Feb., 268-280
Pregnant Young Woman (skeletal remains): Herculaneum, Italy **564,** 570, 581
Presidio, Texas: Cemetery 225
Presidio County, Texas: County seat **228,** 233
The Pretty Lady (skeletal remains): Herculaneum, Italy 581; Analysis of bones 588-589, 599-600; Artist's conception of **588-589**
Price, Edna Mae 80
Price, Stan 80
Priests: "management priest" **186**
Printing industry: Laser applications 335
Product code scanners 366, 374, **375;** Diagram **374**
Prohierodula congica (mantid) **277,** 280
Prostheses, silk 13, **37,** 43, 45
Protein sources: ***Krill–Untapped Bounty From the Sea?*** By William M. Hamner. May, 626-643; Silkworm pupae 12, **15,** 26
Protestantism *see* Amish; Mennonites
Prothero, Bob 659, **660**
Pruitt, B.L. 224
Pucci, Emilio 36
Puget Sound, Wash. 652, 653, 655
Pujol, Jordi **109**
Pupae, silkworm 14, 15, 26; Stir-fried 12, **15**
Purgatory, Church of, Pozzuoli, Italy **625**
Pyroclastic flows and surges (volcanic phenomena) 566, 569, 575, 591, 592, 607, 610; Diagram **577**

Q

Qaanaaq, Greenland: Muktuk sale 538, 539; Narwhal hunting 527; Population 526
Qajoranguaq (Polar Eskimo) 526-527, 530, 531, 534, 538, 539
Qeqertat, Greenland: ***Narwhal Hunters of Greenland.*** By Ivars Silis. Apr., 520-539
Qiang (people): Bread, traditional 307; Marriage customs, earlier 306-307; Population 305; Road construction **314;** Song 306-307; Village towers 305
Qinghai Hu (lake), China 301
Qinghai Province, China 296, 300-301; Minority groups *see* Kazaks; Salars; Tu
Qingshui (river), China: Dragon Boat Festival 327-328, **328-329;** Salamanders, giant 323
Qipissorssuaq (Polar Eskimo) 534
Qissa Khawani Bazaar, Peshawar, Pakistan 705, 707
Qitdlugtoq (Polar Eskimo) **529,** 530, 538, **538,** 539
Qiushe (Autumn Club Festival): Dong people 328, 332
"Queen Esther" (artistic composition) **107**
The Queen of Textiles (silk). By Nina Hyde. Jan., 3-49
Queen of the Missions, Santa Barbara, Calif. **435;** Archives **434**
Queets River Valley, Wash. **649,** 654; "industrial forest" **670**
Quetin, Langdon 636
Quilt patterns: Amish diamond pattern **503;** "log cabin" pattern **502-503**
Quilting: Amish Mennonites **502-503**
Quimigranel Corporation, Tarragona, Spain 115
Quimper Inn, Port Townsend, Wash.: Innkeeper **657**
Quinault River Valley, Wash. 654, 669

R

Rabakela, Petros **410**
Rabbath Ammon (ancient city), Southwest Asia 254
Rabbit Creek, Yukon Territory, Canada: 1896-1898 gold rush 80-81
Raborn, Smiley and Bernice **387**
Radford, Gerry and Annette 171, 174
Radio studio: Calgary, Alberta, Canada **384-385**
Rafts, inflatable sheepskin **304**
Railroad bridges 722, **742;** Double-decked **720-721;** Tiered-masonry arch **710-711**
Railroads: ***By Rail Across the Indian Subcontinent.*** By Paul Theroux. June, 696-743; ***India's Railway Lifeline.*** By Michael G. Satow. June, 744-749
Rain forests: Olympic Peninsula, Wash. **646-647,** 654, 663
Rainbow (textile company): Milan, Italy 48
Rainbow holograms **367,** cover; Making of 372, diagram **373**
Rajdhani Express (train): Speed 748
Rakops, Botswana: Drought **148-149**
Ramage, C. S. 183
The Ramblas (promenade), Barcelona, Spain **103**
Ramos, Hilario **116**
Ramsey, Bill 233
Rana, Kiran Shumshere 417-418
Rancheros Visitadores *see* Los Rancheros Visitadores
Ranchmen's Club, Calgary, Alberta, Canada 383, 391
Rancho del Cielo, Santa Barbara County, Calif. 430, **446-447,** 461
Rangoon, Burma: Rhinoceros

products: Medicinal use 417
Ranunculus, aquatic (water buttercup) **136, 137**
Rapuzzi, George and Edna **84**
Rasmusson, Eugene M. 153, 170, **171,** 181
Ratti, Antonio **42**
Ratti Silk Company, near Como, Italy: 1983 production 43, 48; Paisleys **42;** Silk-screen fabric **43**
Ravello, Italy 185, 186
Raven Tlingits (Indians) 71; Totem **71**
Raw silk yarn **28;** 1984 price 48; Production 15, 19, **28-29**
Rayner, David **342**
Reading, Pa.: Silk mills 42
Reagan, Ronald 435, 438, **446, 447,** 448; Ranch 430, **446-447,** 461
"The Reapers" (Catalonian national hymn) 120
Red blood cells: Genetic surgery **347**
Red crab, pelagic 632, 633
Redford, Texas: Library, private lending 225, 234
Reeves County, Texas: Sheriff **218,** 234
Refugees: Jordan 245, 248, 254, **262-263;** Pakistan 705, 707
Regional corporations: Alaska 53, 60 *see also* Calista; Sealaska
Reidenbach Mennonites 506, 518
Reithel, Frank and Kitty **661**
Reliability research and testing *see* Holographic interferometry
Relics: Blood of San Gennaro 191, 617, 618
Relief, marble: Pompeii, Italy **610-611**
Religious ceremonies: *nazarenos* **112;** Nepalese 417-418; Tibetans **306, 312-313**
Renta, Oscar de la 48
Revolution, Japanese: ***Hagi: Where Japan's Revolution Began.*** By N. Taylor Gregg. June, 751-773
Rexach, Charley 120
Reynolds, Brad: ***Eskimo Hunters of the Bering Sea.*** June, 814-834
Rhinoceros hide: Medicinal products **410,** 411, 422; Prices 411
Rhinoceros horn: Composition 408; Dagger handles made from **410,** 412, 413, 422; Medicinal products 407, **410,** 411, 417, 422; Rhinos killed for 405, 406, **406-407,** 408, 413, 422; Trade 406, **407,** 408, 410, 411, 413, 417, confiscated horns **409,** curtailment of demand 420, 422
Rhinoceroses: ***They're Killing Off the Rhino.*** By Esmond Bradley Martin. Mar., 404-422
Rialp, Spain: Women doing needlework **114**
Ricci family 186, 193
Rice fields: China **330-331;** India 718, 723; Pakistan 707; Spain **122-123**
Richards, Bill: ***Alaska's Southeast: A Place Apart.*** Jan., 50-87; ***The Olympic Peninsula.*** May, 644-673
Rifai, Zaid 249, **249**
Rigo, Mario 208
Rincon Beach, Calif.: Storm **156-157**
The Ring Lady (skeletal remains): Herculaneum, Italy 557, **560,** 570, 600, cover
Rings, gold: Herculaneum, Italy **560,** 570, **591,** cover
Rinnovato, Michele 618, 625
Rio Branco, Miguel, photographer: ***Brazil's Kayapo Indians, Beset by a Golden Curse.*** May, 675-694
Riunite wine: Export 187, 207
River Hei Miao (people) 323; Dress, traditional **320-321,** 323, **328-329;** Food 323, ceremonial rice dish 323, **328-329;** Silver adornment **283, 321,** 323, **328-329**
River Styx group (skeletal remains): Herculaneum, Italy **562,** 570, 581
Roark, David **658**
Robbins, Chandler 554
Roberts, Frederick Sleigh 744
Robots: Automobile manufacture 187, 206; Lasers, use of 342, 356
Rocher, Pierre 40
Rocky Mountains, U.S.-Canada: Record snowpack 160
Rodeos: Trans-Pecos, Texas 220, 228; *see also* Calgary Stampede
Rollefson, Gary: Excavation of Ain Ghazal 261
Roma, Jaume 105
Roman ruins: ***The Dead Do Tell Tales at Vesuvius.*** By Rick Gore. May 557-613; Pozzuoli, Italy 618, 619, market **616-617,** port 621
Rome, ancient: Silk, introduction of 12
Rome, Italy **184,** 186, 188, 206; Aerial view **188-189;** Colosseum **202-203;** Film industry 207
Roosevelt elks: Olympic National Park, Wash. **673**
Ross, Edward S.: ***Mantids, the Praying Predators.*** Feb., 268-280
Ross, Robin 636
Rove beetles: Ant predation **809**
Royal Chitawan National Park, Nepal: Rhinoceroses 418, **420-421**
Royal Jordanian Falcons **239**
Rugs, Tibetan **316-317**
Russian America 70, 83

S

Sabater, Xiquet 127
Sacred cows: India 720, **725**
Saddledome (sports arena), Calgary, Alberta, Canada **386,** 395, 400
Safi, Jordan: Saltworks 256
Sailboats: California **460;** Spain **96-97**
Saint George, Australia: Floods 175
St. Michael's Orthodox Cathedral, Sitka, Alaska 70, 71, 83; Communion **83**
St. Peter's Basilica and Square, Vatican City **188-189**
Sakuma Shozan 757, 765
Salamanders, giant: Central China 323
Salars (people): Dress, traditional **289;** Population 288; Religion 288
Salinas, Ecuador: Floods 146, 167
Salinas Valley, Calif. 430, 453, 456; Migrant workers **436-437,** 456
Salmon: Alaska 64, 79, 816, 817, 819, 822; Washington **665,** 668, 669, 672
Salmon fishing: Alaska 56, 61, 817, 822, 831, catches **79**
Salt Lake City, Utah: Floods 160, **160-161**
Saltworks: Jordan 256
Salvi, Chhotalal 19, 30
Samurai 751, 756, 757, 771-772; Armor **49;** Code (*Bushido*) 751, 755, 761, 764, 765; Duel **752;** End of class 757, 772; Scholarly pursuits 765; Swords 751, **752,** 764, **764,** mantis motif 272, **280;** *see also* Yoshida Shoin, *outlined*
San Andreas Fault, Calif. 449-450, **454**
San Carlos de la Rápita, Spain 124-125
San Luis Obispo, Calif. 430, 441, 443
San Gennaro, feast of 191, 617-618
San Rafael Mountains, Calif. 450, 452, **458**
San Sadurni de Noya, Spain: Vineyards **124-125**
San Simeon (estate), Calif. 443, **450-451;** Indoor pool **452-453**
San Ysidro guest ranch, Montecito, Calif. 443
Sanaa, North Yemen: Rhino-horn daggers **410,** 412
Sand dune racing: California **456-457**
Sanderson, Texas 230
Sanjiang, China: "wind-and-rain bridge" **332-333**
Santa Barbara, Calif. **434, 435,** 443, 448-449; Earthquake (1925) 434, 443; Oil spill (1969) 430
Santa Maria, Calif. 430, 453
Santa Maria Assunta, Basilica di, Gandino, Italy: Vestments, preserved 36-37
Santa Ynez Mountains, Calif. 430, 435, 447, 449
Sappho, Wash. 652
Sardine fishing: California 456; Peru 167, 170
Saris, silk 13, 19, 32; Sari bazaar **32**
Satellites: Antisatellite systems: Lasers **360-361,** 362; Plate tectonics measurements 342-343;

Submarine communications 349, 357
Satow, Michael G.: ***India's Railway Lifeline***. June, 744-749
Sauder, Amos, and family 506, **506**
Saudi Arabia: Jordanian workers 240, 243; Land exchange with Jordan 256
Sausage making **121**
Savard, Helene and Camile **402-403**
Saw blades, laser-cut 335, **350**
Sawfly larva **812-813**
Sawyer, Brian 378, 382
Scale insects: Herded by ants **784,** 793-794; Honeydew secretion 784, 794
Scalplock, Alex 390
Scandone, Roberto 623, 624-625
Schoen, John 64, 65
Schoolhouse, one-room: Candelaria, Texas 226-227
Schreiber, Elizabeth Anne 170
Schreiber, Ralph W. 170-171
Schupach, Pard 231-232
Scorpion, whip: Army-ant attack **798-799**
Scorpion fish **483**
Scrolls, papyrus: Herculaneum, Italy 595, 596, **600-601**
Scudday, Ann 228-229
Sculpture: Modern **107, 384,** 450, 452-453; Pollution damage 208; Roman **590,** 594, 595, 596, **598-599, 610-611,** 613, **622-623**
Sea lions: California **424-425**
Sea otters: California waters 461
Seaboard Lumber Company, Seattle, Wash.: Laser-assisted saws **350**
Seal hunting: Inuit **521,** 524
Sealaska Corporation 71, 72; Board of directors **72,** chairman 71, **73**
Sealskin: Hunting bladders 530, **532;** Kayak covers 527, **529;** Price decline 525, 527
Seattle *Press:* Olympic Peninsula expedition 662
Sefel, Joseph 394
Sei whales: Krill feeding 632
Seiners (fishing boats): Beached **165**
Semiconductor lasers 363
Sentaró Fujita **44;** Notched fingernails **45**
Sepoy Rebellion (1857-1859) 745
seppuku (ritual suicide) 764, 765, 767
Serapis, Temple of, Pozzuoli, Italy **616-617,** 618
Sericin 7, 14, 24; Cocoons tinted with **6-7;** Removal from silk fibers 18, 19, **28**
Sericulture: ***Silk–Queen of Textiles***. By Nina Hyde. Jan., 3-49
Serpentine rock 450, 452-453
Serra, Junípero 434; Signature **434**
Serra d'Or (magazine) 100
Serra Pelada (gold mine), Brazil 694
Seward, William H. 70
Sewell, Pearlie 652-653
Shah, Abbas Ali **708**
Shah Jahan (Mogul emperor) 707; Mosque completed by **703**
Shahdara Bagh, Pakistan: Tomb of Jahangir 708
Shaká, Bassam 266
Shakers (sect): Sericulture 42
Shamans: Tlingit Indians **74, 75**
Shamash, Jack 45
Shank, Charles 355
Shark Liver (Tlingit) **74**
Shavings, Ed 834
Sheep: Slaughtered because of drought 152, **152,** 153
Sheepskin rafts: Yellow River, China **304**
Sheffield, Bill **60**
Shell Hispanica: Offshore oil wells 124-125
Shen Congwen 26
Sheridan, Michael 570
Shi Zhao-ming **294**
Shibambu, Mhephu 176
Shibing, China 323
Shimba Hills National Preserve, Kenya: Weaver ant study 792-794
Shintoism 760; Festival participants **760-761;** Shrines 760, **760-761, 766-767;** Wedding **766-767**
Shirk, Earl **512**
Shirk, Edwin 512
Shirk, Ella **515**
Shmeisani Center, Amman, Jordan 243
Shoe, silk brocade **10**
Shogunate (government) 756, 761 *see also* Tokugawa Shogunate
Shoka Sonjuku (school), Hagi, Japan 755, 760, 767, 770, 771, 772; Revolutionists *see* Sonjuku group
Shrimps 170, **471;** Krill shrimp: *Euphausia pacifica* **634-635,** 640, mysid shrimp 632, 633, *see also Euphausia superba, outlined*
"shunning": Amish 497, 498
Sichuan Province, China 284, 286, 291, **292,** 305, **314, 315;** Minority groups *see* Di; Qiang; Tibetans, *outlined;* Yi
Sicily (island), Italy 185, 193; Volcanic eruptions 196
Sigurdsson, Haraldur: ***The Dead Do Tell Tales at Vesuvius***. By Rick Gore. May, 557-613
Sikandra, India: Mausoleum 718
Sikhs: India 708
Sikorsky S-64 Skycrane: Logging operations 668
Silicon chips: Laser annealing **339**
Silis, Ivars: ***Narwhal Hunters of Greenland***. Apr., 520-539
Silk: ***Silk–Queen of Textiles***. By Nina Hyde. Jan., 3-49
Cultural significance 9, 13, 26, 27
Dyeing 14, 35, 42; Tie-dyeing 8-9, 19, 30, 46, designs produced by **9,** 19, **30, 46, 47**
Economic significance 4-5, 19, 43, 45, 48; 1984 price 48; Synthetic fabrics, effect of 43
Embroidery **2-3, 11, 16-17, 18**
Fibers 14, 15, **24-25;** Degumming 18, 19, **28;** Length and shape of 13, 14, 24; Spinning 19, **28,** thigh reeling 19, **33**
Haute couture, used by 14, **38,** 48
Historical significance 3, 12-13, 48; East-West trade 27, 30, 36 *see also* Silk Road
Production statistics: China 5, 13, 15, 35; India 32; World 15, 28
Products of, utilitarian 13-14, **36, 37;** Vascular prostheses 13, **37,** 43, 45
References to, early 13, 27, 30
Royalty, associations with 12, 13, 18, 27, 30, 37, 39, 48; Louis XIV's bedchamber 40, **41;** Napoleon's silk orders **10,** 40
Sensory appeal 12, 14, 37, 42, 48
Supply and demand 42, 43, 45, 48
Weaving 8-9, 19, 26, **30, 31,** 36, 39, 40, **44;** History 9, 10, 12, 19, 26, 27, 36, 37, 39-40, 42; Technology, advanced 14, 48
Wild silk 14, 35
Silk industry: ***Silk–Queen of Textiles***. By Nina Hyde. Jan., 3-49
Silk Road 20, 27, 30; Map 12-13
Silk-scarf offerings *(khatas):* Buddhism **306**
Silk screen **43**
Silkworms: ***Silk–Queen of Textiles***. By Nina Hyde. Jan., 3-49
Adults *see* Moths, *below*
As food 12, **15,** 26
Cocoons **4-5, 6-7,** 14, 15, **34;** Formation 14, **25;** Processing 7, 15, 18, 19, 26, **28**
Diet: Domesticated silkworms 6, 14, 18, 23, prepared food 14, 18, 23; Wild silkworms 14, 35
Disease 39; Prevention of spread **27**
Eggs 15, **26, 27;** Legendary smuggling 13, 30, 36
Feeding behavior 14
Frass (waste) 15
Gypsy moths, attempted interbreeding with 42
Hybrid 15
Larvae **6, 7,** 14, 15, **23, 25, 35;** Life span 14; Molting 14, 24
Metamorphosis 14-15 *see also* Moths, *below*
Moths **13,** 14-15, **26**
Pupae 14, 15, 26; Stir-fried 12, **15**
Silk glands 14, **24;** Secretion, composition of 14, 24
Species 7, 14
Wild silkworms 14, 18, **35;** Tussah cocoons, quality of 35
Silva, Anazildo 683, 687
Silver adornment: Chinese ethnic groups: Ge **282,** 315, **324-325,** Miao and subgroups **283,** 315, **321,** 323, **328-329,** Mpeo 313, 315
Simla, India 704, 712; Rail line **698-699,** 710, **710-711,** 749

Simla Mail (train) 710-711
Simla Queen (train) 711
Simmons, Alan 261
Simons, Menno 498
Simpson Timber Company: Logging camp 668
Sinai Hospital, Detroit, Mich.: Laser surgery 352
Singh (family name) 708
Sinkholes: ***Exploring a Sunken Realm in Australia.*** By Hillary Hauser. Jan., 129-142
The Siq (passage), Petra, Jordan 250
Sirhan, Khalaf 256
Sitka, Alaska 70, **82-83;** Cathedral 70, 71, 83; History 70, 83; Lumber industry 64
Six Day War (1967) 242, 245, 249
Skagway, Alaska 81; 1896-1898 gold rush 81, 84
Skeletons, human: ***The Dead Do Tell Tales at Vesuvius.*** By Rick Gore. May, 557-613
Ski resorts: Italy **200-201;** Spain 119
Skiles, Jack 232
Skookum Jim 80
"sky burial": Tibetans 291, 304-305
Sladen, William J. L. 554
Slash-and-burn agriculture: Kayapo Indians 693, 694
Sled dogs: Greenland **522-523,** cover
Smiran, Megbel 256
Smith, Griffin, Jr.: ***Texas West of the Pecos.*** Feb., 210-235
Smith, H. Allen 230
Smith, Tom 652, **653**
Smuggling: Cigarettes **196, 197;** Rhino horns 411
Snake-necked tortoise, Australian **142**
Snowfall: Jordan **258-259**
Snowmobiles: Alaska 816, 817, 821, 823, 829, 834
Snure, Rand 81
Soccer: Barcelona, Spain 120, fans **94-95;** Italy 185
Soft coral **465-469, 478-479, 484**
Softball game: Amish Mennonite girls' teams **502-503**
Solar reflector **302**
The Soldier (skeletal remains): Herculaneum, Italy 557, 570, **572;** Artist's conception **573;** Sword and tools 557, **572-573**
Soleduck River, Wash.: Spawning salmon **665**
Solio Wildlife Sanctuary, Kenya: Rhinoceroses **415, 422**
Solvang, Calif. 435, 442, 443
Songke grasslands, Gansu Province, China: Tibetan festival **306, 310-311**
Sonjuku group (Yoshida students) 767, 770; Japanese rebellion (1864-1868) 752, 755, 756, 759, 770, 771-772
Sottsass, Ettore **198**
South Africa: Drought 175-176, 181, **182-183;** Rhino-hide trade 411; Rhino-horn trade **407,** 408, 410, 411, confiscated horns **409;** Rhinoceroses 407, 411, 414, 422, map of range 412; Wildlife conservation 408, 414, 422
South America: Anchoveta industry 155, 164, 167; Floods **146-147,** 155, 160, 167, 181; Indians *see* Kayapo Indians; Pacific coastal food chain **164,** 167, 170
South Australia (state), Australia: ***Exploring a Sunken Realm in Australia.*** By Hillary Hauser. Jan., 129-142
South Luangwa National Park, Zambia: Rhinoceros killed by poachers **406-407**
South Pacific islands: Storms **144-145,** 155, 170
Southeast Alaska:
Alaska's Southeast: A Place Apart. By Bill Richards. Jan., 50-87
Birds: Bald eagles **68, 69,** 70, fall gathering 65, **68-69,** 70; Seabirds 75
Economy 53, 60, 81, 83 *see also* Fishing industry; Logging, *below*
Environmental concerns 53, 60, 64, 65, 67, 70, 77, 83
Fishing industry 53, 56, 61, 72, **78,** 79
Gold strikes, 19th-century 62-63, 80; Gold rush 80-81, 82, **85**
Government employment 53
History 62-63, 70, 71, 75, 80-81, 82, 83
Ice field 56, **62-63**
Islands, number of 56, 57
Length of (Panhandle) 56, 57
Logging 64, 65, **76-77;** Habitat destruction and 53, 64, 65, 67, 77; Timber exports: Japanese market 53, 64, 76
Map 56-57
Native Americans 53, 70, 71, **71-74,** 75, **75;** Corporations 53, 71, 72, 76; Land-claim settlements 53, 71
Natural resources 53, 60, 64, 71, 82
Pioneers 75, 80; Present-day 80
Population 56, 57
Rainfall, annual 56, 61, 70
Seismic activity: Lituya Bay upheaval (1958) 83, water surge 83, 86, 87
Settlement 57, 62-63, 70, 75, 80, 81
Shoreline, length of 56
Thermal springs 61, 68, 81
Timber reserves 53, 64, 77
Tourism 53, 60, 81, 83
Tourists 53, **59,** 75; Bird watchers 65, 68
Transportation: Air service 60, 65, 86; Ferry service **59,** 70; Roads 56
Vegetation 64-65, **68-69,** 75, **76**
Weather and climate 53, 56, 86; Coastal climate 59
Wildlife 64-65, **67,** 80; Habitat threatened 64, 65, 67, 77; *see also* Birds, *above*
Winter activities 56
An Incredible Feasting of Whales. By Al Giddings. Jan., 88-93
Southern Oscillation 153, 181
Space shuttle: *Discovery* 430, launch site **458**
Spain: ***Catalonia: Spain's Country Within a Country.*** By Randall Peffer. Jan., 95-127
Spanish missionaries: 16th-century Japan 756
Spanish missions: California 434, **434, 435,** 442
Sparck, Harold 829
Spectra Physics, San Jose, Calif.: Laser-cut saw blades **350**
Spectroscopy: Holographic optical elements 366
Spectrum, electromagnetic 338; Diagram **338**
Spider crabs **488-489,** 489-491, **491;** Painted shell **490**
Spinning, silk 19, **28;** Thigh reeling 19, **33**
Spinning wheel: Chinese Miao **288**
Spiny crayfish **142**
Spitalfields (district), London, England: Silk weaving 10, 12, brocade **10**
Sportfishing: King salmon catches **79**
Spradling, Brent **273**
Spring Cave (the Pines), South Australia **132-133,** 133
Spring Club festival: Dong people 288, 328, 332
Spruce, Sitka 653
Square dancing: Calgary Stampede **385**
Squid **475**
Squid fishing: Japan **474-475**
Squires, Tom 392
Stabiae, Italy: Death of Pliny the Elder 574, 584
Stags, House of the, Herculaneum, Italy **579, 593**
Staphylinid beetles: Ant predation **809**
Starfish **470, 484;** Close-up **471;** Feeding: Krill **640-641;** Reproduction 470
Starret House, Port Townsend, Wash. **657**
State Street, Salt Lake City, Utah: Flood (1983) **160-161**
State Street, Santa Barbara, Calif. 443, 448
Statues, plaster: Ain Ghazal (site), Jordan **261**
Stazio, Attilio 595
Steam bathing: Yupik Eskimos 816, **830**
Steam engine, 1921: Amish farm **516**
Steelheads (trout) **664,** 668
Steffy, Richard 571, **602,** 604, 606
Stein, Alan 56, 61
Steinbeck, John 430, 437, 453, 456

Stephen Avenue, Calgary, Alberta, Canada **384,** 386-387
Stern, Cecily **50**
Stink ant **783**
Stockings, silk 42
Stoltzfus, Samuel **504;** Cousin Lloyd **505**
Stone Mountain, Ga.: Laser animation **337**
Storms: ***El Niño's Ill Wind.*** By Thomas Y. Canby. Feb., 144-183
Storytellers' Bazaar, Peshawar, Pakistan 705, 707
Stradivari, Antonio 207
Strand, Steven 630, **642**
Stucky, Rex: Photographic print of "Last Supper" 555
Submarines: Laser communications 348-349, diagram **357;** Nuclear-powered: Trident class 659, **666-667,** base 659, 666
Subway cars, Italian-made: United States 186, 187
Sudan: Rhino-horn trade 410, 413
Sugar ants, Australian 774, **774-775**
Sul Ross State University, Texas 220; Students **229, 232**
Sumatran rhinoceroses **413;** Dispersion 406, 420-421; Medicinal products 417; Population (1983) 406, 413, 420; Range 406, 413
Sun Silk Company, Lowell, Mass.: Silk batting manufacture **37**
Sunset Beach, Calif.: Sandbag preparation **156**
Sunshine Aquarium, Tokyo, Japan **491**
Surgery: Computer applications **391;** Lasers used in 335, **344,** 345, **345,** 346, **347,** 352-353, eye surgery **344,** 345, diagram **345;** Silk sutures 14; Vascular prostheses **37,** 43, 45
Suri, G. L. 716
Surour, Hayel **257**
Surrealistic art: Museum exhibition **107**
Surviving, Italian Style. By William S. Ellis. Feb., 185-209
Sutherland, Ian 594
Suzhou Embroidery Research Institute (China): Craftswoman **18**
Swisher, Frank 668
Swords, samurai 751, **752,** 764, **764;** Guards 272, **280**
Symbiosis: Morwong and wrasse **486;** Shrimp and starfish **471**
Synthetic fabrics 43, 45
Synthetic sonic logs 400

T

Taccogna, Anna **612**
Tagish Charley 80
Taj Mahal, Agra, India 704, 718, **722-723,** cover
Takasugi Shinsaku 771, 772
Tamae Shrine, Hagi, Japan: Festival participants **760-761**
Tantanoola Forest Reserve, South Australia: Sinkholes 133
Tanzania: Poaching 405, 406; Rhinoceroses 406, **418,** carcass **404-405**
Tapestry panels, brocaded: Palace of Versailles, France 40, **41**
Tàpies, Antoni 115, 118
Tarachodes (mantis genus) **278-279**
Tarragona, Spain: Chemical industries 115; Holy Week procession **112;** Industrialization 113, 115
Tassinari, Bernard 40, **41**
Tassinari & Chatel (silk-weaving firm), Lyon, France 10, 40
Tatsunori Yamaichi 764
Tax evasion: Italy 186, 192, 193, 196
Taylor, Billie **58**
Taylor, Robert W. 785
Tea plantations: India 734
Team Mennonites 501, 512
Teatro Museo Dalí, Figueras, Spain **107**
Technology: ***Lasers–"A Splendid Light."*** By Allen A. Boraiko. Mar., 335-363; ***The Wonder of Holography.*** By H. John Caulfield. Mar., 364-377
Tel al-Ashur, Jordan 258
Telemetry *see* Biotelemetry
Telephones: Optical fibers 336, 363, laser use 366
Teller, Edward 363
Tenakee Springs, Alaska 61, 81; Tavern **81**
Tent communities: Pozzuoli, Italy **614-615,** 618, 625
Tents: Architectural design competition **440-441;** Tibetans **310, 318;** *see also* Yurts
Terlingua, Texas 229-230
Tern eggs: Gathered by Inuit 526, 531
Teters, Dennis 390
Texas West of the Pecos. By Griffin Smith, Jr. Feb., 210-235
Textiles *see* Silk
Thailand: Silk industry 27
Thammasithiboon, Prasert 233
Theater, Roman: Herculaneum, Italy 566, **566-567, 569, 578,** 595, 613
Therchik, Laura **826**
Therchik, Nick 822, **826**
Thermal springs: Alaska 61, 68, 81
Thermoclines 469
Theroux, Paul: ***By Rail Across the Indian Subcontinent.*** June, 696-743
They're Killing Off the Rhino. By Esmond Bradley Martin. Mar., 404-422
Thigh reeling (silk spinning method): India 19, **33**
38,000 Miles of Track: India's Railway Lifeline. By Michael G. Satow. June, 744-749
Thistle, Utah: Flood **156**
Thompson, Jim 27
3M plant, Menomonie, Wis.: Videodisc, laser-recorded **362**
Thule Inuit: ***Narwhal Hunters of Greenland.*** By Ivars Silis. Apr., 520-539
Tibetan Autonomous Region, China *see* Xizang Autonomous Region
Tibetan Buddhism 291, 295, 301, 306; Buddhas, living **306,** 311; Dalai Lama 295, 306; Lamas and lamaseries 301, 303, 304-305, **307, 308-309,** 311; Tenets 306
Tibetans: ***Peoples of China's Far Provinces.*** By Wong How-Man. Mar., 283-333
Burial customs 291; "sky burial" 291, 304-305
Education: Colleges (Labrang Lamasery) 303, 308-309
Festivals **306, 311;** Drama **311**
Fish taboo 291
Food and drink 293, **318-319**
Greeting gestures 291
Herding 319; Yak herding 293
Horse race, annual (Markam): Participants **316, 318-319**
Horseback riding code 317
Hospitality 291, 293
Nomads and semi-nomads 291, 311, **318-319;** Yak herders 293
Religion: Offerings **306,** 312; Rituals **312-313;** *see also* Tibetan Buddhism
Rugs **316-317**
Subgroup *see* Di (White Horse Tibetans)
Tea drinking 293
Tents **310, 318**
Weapon wearing 305, 319
Tickle Pink Inn, Carmel Highlands, Calif. 443
Tie-dyeing: Silk 8-9, 19, 30, 46, designs **9,** 19, **30, 46, 47**
Ties, silk: Manufacture **43,** 48
Tiger eel **486-487**
Timber reserves: Southeast Alaska 53, 64, 77
Tires, silk bicycle 13-14, **37**
Tlingit Indians 70, 71, **72, 73;** Shamans **74, 75;** Totems **71**
TOGA *see* Tropical Ocean and Global Atmosphere
Toishi Fishery Cooperative, Nagasaki, Japan **634**
Tokorozawa City, Japan: Silkworm-raising station 18-19
Toksook Bay (village), Alaska: ***Eskimo Hunters of the Bering Sea.*** By Brad Reynolds. June, 814-834
Airstrip 817, 823
Community hall 823, 838, 834
Dances 823, 834
Economy 817, 822, 819, 831
Electricity 816
Employment 817, 822, 823, 831
Establishment 816, 817, 832-833
Map 817
Musk-ox hunt 834
Oil exploration 828, 829
Population 817, 833
Regional corporation 829
Roman Catholic church 822, 826

Schools 820-821, 823
Supplies 817
Village corporation 829
Weather 820-821, 822
Tokugawa Shogunate (1603-1867) 751, 756, 757, 765-767; Fall of 763, 772 *see also* Meiji Restoration; Rebellion against (1859-1867) **752-754,** 758, 767, 770, 771-772; United States, treaties with 767
Tokyo Bay, Japan 755
Tomb of Abraham, Hebron, Jordan 262, **266-267,** 267
Tomoe Inn, Hagi, Japan 755, 772; Courtyard window **773**
Tongass National Forest, Alaska 64, 76, 77; Commercial logging 64
Tornadoes: Los Angeles, Calif. **157**
Torre de Riu castle, Spain **121**
Toshio Ito 14
Totem poles: Alaskan Indians 71, carving of **71**
Toto'i (Kayapo chief) 675, **681,** **686,** 688
Towers: "drum towers" 328, **330,** **331;** Watchtowers 305
"toy train": India 728, 729, 730, **736, 737**
Trade winds: El Niño currents 163
Trail-riding club: California 434-435, 438, **448-449**
Trains: ***By Rail Across the Indian Subcontinent.*** By Paul Theroux. June, 696-743; ***India's Railway Lifeline.*** By Michael G. Satow. June, 744-749; Texas **217**
TransCanada PipeLines Limited 387
Transjordan (emirate) 242, 245
Trans-Pecos (region), Texas: ***Texas West of the Pecos.*** By Griffin Smith, Jr. Feb., 210-235
Agriculture **214-215,** 233
Area 224, 226
Bilingualism 225-226, 234
Cattle industry 214, 223, 227, 228, 229, 234
Commerce 228, 229, 234
Electricity introduced 224, 234
History 224-225, 226, 229, 231, 232
Irrigation **214-215,** 218, 226, 233
Land sales 229, 234
Map 226-227
Mexican-Americans 226, 227, 233-234
Oil 214, 233, 234
People, character of 218, 224, 225, 229, 230, 231, 234
Population 224, 226
Railroads **216-217,** 224, 228, 231
Rodeos 220, 228
Water problems 215, 223, 227, 234
Wildlife **222-223,** 224, 227
Transportation *see* Railroads
Trawlers: Krill harvesting: Antarctica **633,** 640-641, support vessels 641
Tredwell, Solomon, and wife 749
Trellis House, Herculaneum, Italy 569, **579**
Trellised fields, Ercolano, Italy **582-583, 587**
Trident submarines 659, **666-667**
Triglochin (plant) **136-137, 139**
Tripergole, Italy 619
Tropical Ocean and Global Atmosphere (TOGA): Research plans 181
Trout: Galaxiids 136; Steelheads **664,** 668
Trouvelot, Leopold 42
Trudeau, Pierre: Opposition in western Canada 394, 400, 401
Tsimshians (Indians) 53, 71
Tsunami: Lituya Bay, Alaska (1958) 83, 86, 87
Tsune Sakai 490-491
Tu (people) **300,** 301; Dance **300;** Dress, traditional **300,** 301; Food and drink 301, 303; Hospitality 301, 303; Marriage customs, former 300, 301, 303; Population 300, 301
Tuamotus (islands), Pacific Ocean: Storms **144-145,** 170
Tumbes, Peru: Shrimp industry 170
Tunnels: Laser measuring of **351;** Lyon, France 40
Tupong (fish) **136**
Turin, Italy: Automobile industry 206, auto show **198-199**
Turkey vultures **222-223**
Turtles: Australia **142;** Kayapo Indian festivals **692-693**
Tussah silk 14, 35
Tussah silkworm: Cocoons **34;** Larva **35;** Protection from predators **34**
Twain, Mark: Quoted 734
Typewriter design: Olivetti company **198,** 206

U

Uganda: Poaching 404, 405-406; Rhinoceroses 404, 405, 406
Ujung Kulon Nature Reserve, Java: Rhinoceroses 413, 420
Ulka Express (train) 730
Ultraviolet lasers 335, 338, 348
Umkumiut (village), Alaska 816
Umm al-Jamal, Jordan: Bedouin **257**
Underwater park *see* Izu Oceanic Park
Union of Indigenous Nations (UNI): Brazil 694
Union of Soviet Socialist Republics: Krill harvesting **633,** 636, 640, 641; Laser weapons research 362
Union Pacific railroad: Terminus, proposed western 655; Tunnels, laser measuring of **351**
United States: *Alaska,* The Making of America map series. Jan. supplement; ***El Nino's Ill Wind.*** By Thomas Y. Canby. Feb., 144-183; *Far West,* The Making of America map series. Apr. supplement; Japan, opening of: Perry expeditions **750,** 751, 766-767; Rail passengers 744; Silk 42, 43, 45, imports 5, 42, 45, sericulture attempts 42; *see also* Alaska; California; Pennsylvania; Texas; Washington
U. S. Air Force: Laser antimissile tests 362
United States Borax and Chemical Corporation: Molybdenum mine development 82-83
U. S. Fish and Wildlife Service: Bald eagle study 69
U. S. Geological Survey: Laser use 343
U. S. Navy: Laser applications 348-349, diagram **357;** Perry expeditions **750,** 751, 766-767, 772; Trident submarines 659, **666-667**
U. S. Route 101: Olympic Peninsula, Wash. 652, **671**
Universal Product Code (UPC) 374; Scanner 366, 374, **375,** diagram **374**
University of Calgary 391, 400; Hospital **391**
University of California: Krill studies 630, 636
University of Jordan 248, 254; Students **254**
University of Rochester: Fusion reactor 357, 362, fuel pellets **355,** 357
Upatnieks, Juris 366
Uranium isotopes: Laser separation 357
Urbania, Italy: Blue jeans manufacture **186**
Urbino, Italy: Aerial view **204**
Ursi, Corrado Cardinal 618
Utah: Floods **156,** 160, **160-161**
Uygurs (people): Silk patterns **8-9, 30,** weaver **31**

V

Vaal River, South Africa: Drought 175-176
Vacirca, Giovanni 196
Valdivia, Julio 167, 170
Valentine, Texas 227, 228; Faith healer 227-228, **231,** 233
Valenzi, Maurizio 192
Valle de Aran, Spain **98-99**
Vancouver Island, British Columbia, Canada: Krill 632, 633
Vandenburg Air Force Base, Calif.: Chumash Indian sites 433-434, **457,** 461; Launch site of space shuttle *Discovery* 430, **458;** Missile test site 430, protest against **455**
Van Horn, Texas **210-211;** Bus station 229
Varanasi, India 704, 722; Ghats 721; Sari bazaar **32;** Train station 720
Vascular prostheses, silk 13, **37,** 43, 45

Vatican City: Aerial view **188-189**
Veale, W. L. 400
Vehicular recreation areas: California 449, **456-457**
Velvet, silk 37; Clock made from **40**
Venice, Italy 196, 208; Café **209**; Silk industry 27, 36; Tourists 208
Venus (goddess): Statue **590**
Versailles, Palace of, France: King's bedchamber restoration 40, brocades 40, **41**
Vestments, silk: Gandino, Italy 36-37
Vesuvius, Mount, Italy: ***The Dead Do Tell Tales at Vesuvius.*** By Rick Gore. May, 557-613
Vettii, House of the, Pompeii, Italy 594, **611**
Victoria Terminus, Bombay, India: Architecture 749
Videodiscs: Laser-recorded **362,** 363
Videotape equipment: Alaska **825,** 828
Vilá, Jordi 120
Villa, Pancho 224-225
Villafranca del Panadés, Spain: Festival **126**
Village Leagues: West Bank, Jordan 266
vin cau (hot after-dinner drink) **116-117**
Vineyards: California 442; Italy 207; Spain **124-125**
Violin makers: Cremona, Italy 187, 207, school for 208
Violinist: Mount Royal College **388**
Visa International: Credit card hologram 374, **375**
Viti, Paolo 206
Volcanoes: Mount Etna, Sicily 196; Phlegraean Fields Caldera, Italy 619, **619,** 623; *see also* Vesuvius, Mount
Vultures, turkey **222-223**

W

Wadi Musa, Jordan 250
Wadi Ramm, Jordan **238-239**
Walker, Clive 178, 181
Walker, Marion 225
Wallace, J. Michael 160
Wallop, Malcolm 362-363
Walrus tusks 823, **827**
Wang Shunyi **34**
Ward, James 233
Wardell Station (ranch), Australia: Stock pond **173**
Warner, Susan **67**
Warren, Mich.: General Motors research laboratory **348,** 355
Wasatch Range, Idaho-Utah: Runoff (1983) **160-161**
Washington: ***The Olympic Peninsula.*** By Bill Richards. May, 644-673
Water buttercups **136, 137**
Waterfalls: Guizhou Province, China **322**
Waterpoort, South Africa: Fodder cutter **178**
Watts section, Los Angeles, Calif.: Tornado aftermath **157**
Wax figure: Yoshida Shoin **756**
Ways of the Ant. By Bert Hölldobler. June, 779-813
Weapons industry: Italy 187
Weather: ***El Niño's Ill Wind.*** By Thomas Y. Canby. Feb., 144-183
Weatherby, Lela 224
Weaver ants: Anatomy **787;** Herding **784,** 793-794; Nests 783, **783,** 792, construction **780-781,** 792, defense of **782-783,** 786, 793; Queens **788,** 789, 794; Territoriality 782, 792, 793
Weavertown Church, Weavertown, Pa.: Girls' softball team **502-503**
Weaving, silk 8-9, 19, 26, **30, 31,** 40, **44;** History 9, 10, 12, 19, 26, 27, 36, 37, 39, 40; Technology, advanced 14, 48; Tie-dyed warp **8-9, 31**
Weber, Karl 596
Wedding reception: Starret House, Port Townsend, Wash. **657**
Weddings: Ercolano, Italy **612-613;** Kazaks **298-299;** Lancaster County, Pa. **496-497;** Makah Indian dancer **663;** Shinto **766-767**
Wenger Mennonites (sect) 500, 506, 512; Meetinghouse **500-501**
West, Richard: Quoted 216-217, 227
West Bank, Jordan: Arabs 242, 257, 258, 261; Colleges 258, 261; Farming 261-262; Israeli occupation 242, 245, 261, 266, resistance to 263, 266; Israeli settlements 242, 261, 262, **264-265;** Palestinian nationalism 258, 261; Village Leagues 266
Wetlands: ***Lord of the Shallows–The Great Blue Heron.*** Apr., 540-554
Whale hunters: Makah Indians 672; ***Narwhal Hunters of Greenland.*** By Ivars Silis. Apr., 520-539
Whales *see* Baleen whales; Humpback whales; Narwhals
Whaling camp, ancient: Cape Alava, Wash. 672
Wheat harvest: Lancaster County, Pa. **510**
Wheeless, Leon 353
Whip scorpion: Army ants attacking **798-799**
Whitcomb, Stanley 363
White Horse Tibetans *see* Di
White rhinoceroses 404, **412, 414-415;** Population increase, areas of 407, 412, 414, 422; Range 412; Size 408, 412
Wick Fowler Memorial World Championship Chili Cook-off 229-230
Wild silkworms 12, 14, **35;** Protection of 18, **34**
Wildlife, Drought-stricken 153, **173, 175,** 178, **179, 180,** 181
Wildlife management: Olympic National Park, Wash. 662-663
Wildlife trade: ***They're Killing Off the Rhino.*** By Esmond Bradley Martin. Mar., 404-422
Williams, Carroll 14, 36
Williams, Michael 71
Williwaws (winds): Southeast Alaska 56
Wills, Terry 86
Wilmot, Lloyd 178
Wilson, Edward O. 800
"wind-and-rain bridges": Dong architecture 328, **332-333**
Wine making: California 442; Italy 186, 187, **190,** 207; Spain 124-125
Winter Olympic Games (1988) 387, 392, 400
Wolber Tire Company, Soissons, France **37**
Wolinsky, Cary, photographer: ***Silk–Queen of Textiles.*** Jan., 3-49
The Wonder of Holography. By H. John Caulfield. Mar., 364-377
The Wonderfully Diverse Ways of the Ant. By Bert Hölldobler. June, 779-813
Wong How-Man **290;** ***Peoples of China's Far Provinces.*** Mar., 283-333
Wood, Lowell 349, 352
Wood ants, European **812-813,** 813; Black wood ants **808-809**
Woodcreeper, barred **799**
Woodpeckers: Ant mound predators **812**
Woods Hole Oceanographic Institution: Krill study 630
World Wildlife Fund: Rhinoceroses protected by 411, 420
Wrasse **486**
Wulongbei Commune, China **34-35**
Wuyang (river), China: Giant salamanders 323
Wyrtki, Klaus 181, 182

X

X-ray holograms 367, 370
X-ray lasers 338, 349, 352; Antimissile defenses 352, 363
Xavier, Saint Francis 756
Xi Ling Shi, Empress (China) 18
Xiahe, China *see* Labrang Lamasery
Xingu River, Brazil: Kayapo Indians 675, 683, 694, trade 687-688
Xiquet de Vals (human pyramid) **126**
Xizang Autonomous Region, China (Tibet) **290,** 293, 295, **316-317, 318;** Accessibility 301; Population 309; Rebellion (1959) 305, 306, 319; *see also* Lhasa

Y

Yak herding: Tibetans 293

Yamaga Soko 765
Yamagata Aritomo 772
Yamane Rinsaku 764
Yamuna River, India **720-721**
Yangtze (river), China: Source 300
Yarmuk River, Jordan 249, 250
Yates, Ira G. 233
Yellow River, China: Bridge **304;** Sheepskin rafts **304**
Yi (people) 290-291; Dress, traditional **293;** Farming **292;** Population 290; Slavery system 290-291, 293; Social structure (pre-1955) 290
Yitav (settlement), Jordan 261
Yoder, Levi **496-497**
Yoritomo (shogun) 755-756
Yoruba (people): Silk workers 261
Yoshida Shoin (1830-1859): ***Hagi: Where Japan's Revolution Began.*** By N. Taylor Gregg. June, 751-773
Birth and birthplace 751, 756, 757, 760
Execution of 756, 771
Grave 760
Imprisonment 751, **756,** 765, 767, 771
Influences upon 757, 765
Memorial compound 760
Perry, contact with 751, 765
Physical appearance 760, 764; Wax figure of **756**
Precocity 760
Reformer; revolutionary 755, 756, 760-761, 764, 765, 767, 770-771
Samurai 751, 757, 765, 771
Scholar 765; Reading discipline 765
Teacher 751, **756,** 760, 767, 770; School 755, 760, 767, 770; Students 751, 752, 755, 756, 759, 767, 770, 771-772
Travels 764-765
Writings 760-761, 765, **765,** 770, 771; Poems 760, 771
Yttrium-aluminum-garnet (YAG): Laser medium 341, 343
Yupik (language) 822, 823
Yupik Eskimos: ***Eskimo Hunters of the Bering Sea.*** By Brad Reynolds. June, 814-834
Adolescents 823, 828, 829
Children, raising of 822
Clothing 823, **826**
Crafts 826
Education 820-821, 823, 826
Entertainment 822, 823, **824-825,** 828, 834
Family loyalty 822, 823
Fishing 816, 817, 819, 822, 829, 831; Commercial 817, 822
Food 816, 817, **819,** 822, 828, 829, 834; Sharing of 816, 819, 822, 834
Homeland, ties to 822, 823
Hunting 815, 816, 819, 834
Income 817, 822, 823, 831
Labor, division of 822, 823
Languages 823, 826
Marriage 822, 823
Roman Catholicism 822
Steam bathing 816, **830**
Traditions, erosion of 834
Transportation 816, 817, 821, 823, 829, 834; Water **814-815,** 816, **832**
Yurts: Kazaks **296-297**
Yusha (mountain), Jordan 267

Z

Zahran (quarter), Amman, Jordan 243
Zambia: Rhinoceros carcass **406-407**
Zare, Richard 353, 355
Zarqa River, Jordan 248, 250
Zhang Changjiu 287, **290,** 295, 300, 308, 315
Zhaoxing, China **330-331**
Zheduo River, China: "water burials" 291
Zheng Wenzhong: Embroidery design by **2-3**
Zhenjiang Sericulture Institute, Jiangsu Province, China: Silkworm cocoons **6-7**
Zulus **183;** Rhino-horn preparations **407, 410,** 411

INDEXING STAFF

JOLENE M. BLOZIS *Editor*
MARTHA K. HIGHTOWER *Assistant Editor*
ANNE K. McCAIN *Issue Editor*
JEFFREY A. BROWN
GEORGE I. BURNESTON, III
DIANNE L. HOSMER
CHARLES M. ISRAEL
TERESA S. PURVIS
CATHERINE WARFORD
MICHAEL G. YOUNG